

**1328 FULTON STREET  
FULTON SOUTH  
BROOKLYN, NEW YORK**

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## **Remedial Action Work Plan**

**NYC VCP Number: 14CVCP192K  
OER Project Number: 13EH-A393K**

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# **REMEDIAL ACTION WORK PLAN**

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## LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer

PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

# CERTIFICATION

I, \_\_\_\_\_, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Fulton South Site (Site number 14CVCP192K).

I, \_\_\_\_\_ am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the Fulton South Site, (Site number 14CVCP192K).

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

\_\_\_\_\_  
Name

\_\_\_\_\_  
NYS PE License Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
QEP Name

\_\_\_\_\_  
QEP Signature

\_\_\_\_\_  
Date

PE Stamp

# **EXECUTIVE SUMMARY**

Fulton South Development LLC has applied to enroll in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 11,521-square foot site located at 1328 Fulton Street in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

## **Site Location and Current Usage**

The Site is located in the Bedford Stuyvesant section of Brooklyn, New York and is identified as Block number 1861 and Lot number 119 on the New York City Tax Map. Figure 1 is a Site location map. The Site is 11,521-square feet and is bounded by Fulton Street to the north, three- and four-story residences and a church to the south, seven-story apartment building to the east, and three-story residential building with retail storefront to the west. Currently, the Site is used as a concrete-paved parking lot and contains no buildings or other Site improvements.

According to information obtained from the New York City Department of Finance (NYCDOF), the Site is identified as Block 1861, Lot 119 (formally part of Lot 20, the subdivision became effective August 2012). The Site is listed with E-No. E-185, CEQR No. 07DCP070K, and ULURP No. 070447ZMK.

## **Summary of Proposed Redevelopment Plan**

The proposed use of the Site will consist of a new 10-story concrete and brick facade mixed-use rental building located on Fulton Street, in the Bedford Stuyvesant section of Brooklyn, NY. This new development will replace the existing vacant lot, being used as a parking lot, with approximately 14,000 square feet of retail and community facility space and fifty-seven (57) studio, one, two, and three bedroom rental units. The proposed cellar, sub-cellar and 1st floor

will encompass the entire lot, 115.21' wide by 100' deep, with the sub-cellar being approximately 23' below grade which is above the groundwater table (groundwater table estimated between 50 to 55 feet below grade). The cellar will be used for commercial space, and vehicle parking. The sub-cellar will be used for vehicle parking, trash room, tenant storage, and bicycle parking. The current zoning designation is C4-5D which is a commercial district that permits residential, commercial, and community facility buildings. Layout of the proposed site development is presented in Figure 2 and Appendix 4. The current zoning designation is C4-5D which is a commercial district that permits residential, commercial, and community facility buildings.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

### **Summary of the Remedy**

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establish Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;

5. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. For new development, the entire foot print of the site will be excavated to a depth of 23 feet below grade;
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite;
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
11. As part of development, construction and maintenance of an engineered composite cover consisting of a minimum 6 inch thick cellar parking garage concrete foundation to prevent human exposure to residual soil/fill remaining under the Site;
12. As part of development, installation of a GSE Environmental 20-mil or OER approved equivalent vapor barrier system beneath the building slab and outside foundation sidewalls below grade;
13. As part of development, construction of an ventilated (high volume air exchange) parking garage per NYC Building's codes and regulations;
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;
16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and if Track 1 SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site;
17. If Track 1 Unrestricted Use SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for maintenance, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency;and
18. If Track 1 Unrestricted Use SCOs are not achieved, the property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

## COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

**Remedial Investigation and Cleanup Plan.** Under the NYC VCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

**Identification of Sensitive Land Uses.** Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals and residential areas. The cleanup program was then tailored to address the special conditions of this community.

**Qualitative Human Health Exposure Assessment.** An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

**Health and Safety Plan.** This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration. This plan includes many protective elements including those discussed below.

**Site Safety Coordinator.** This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Gabriel Richardson with Safety Dynamics and can be reached at 718-389-4530.

**Worker Training.** Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

**Community Air Monitoring Plan.** Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan or CAMP. Results will be regularly reported to the NYC Office of Environmental Remediation. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a ‘Contingency Plan’).

**Odor, Dust and Noise Control.** This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager, Gabriel Richardson with Safety Dynamics at 718-389-4530 or NYC Office of Environmental Remediation Project Manager, Horace Zhang at 212-788-8484.

**Quality Assurance.** This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

**Storm-Water Management.** To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

**Hours of Operation.** The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7:00 a.m. to 4:00 p.m. Monday through Friday.

**Signage.** While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

**Complaint Management.** The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager, Gabriel Richardson with Safety Dynamics at 718-389-4530, the NYC Office of Environmental Remediation Project Manager Horace Zhang at 212-788-8484, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

**Utility Mark-outs.** To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

**Soil and Liquid Disposal.** All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

**Soil Chemical Testing and Screening.** All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

**Stockpile Management.** Soil stockpiles will be kept covered with tarps to prevent dust, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

**Trucks and Covers.** Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

**Imported Material.** All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

**Equipment Decontamination.** All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

**Housekeeping.** Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

**Truck Routing.** Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the

property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

**Final Report.** The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at the Bedford Branch Library, 496 Franklin Avenue, Brooklyn, New York.

**Long-Term Site Management.** If long-term protection after the cleanup is required, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined in the property's deed or established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

# **REMEDIAL ACTION WORK PLAN**

## **1.0 SITE BACKGROUND**

Fulton South Development LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 1328 Fulton Street in the Bedford Stuyvesant section of Brooklyn, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

### **1.1 SITE LOCATION AND CURRENT USAGE**

The Site is located in the Bedford Stuyvesant section of Brooklyn, New York and is identified as Block number 1861 and Lot number 119 on the New York City Tax Map. Figure 1 is a Site location map. The Site is 11,521-square feet and is bounded by Fulton Street to the north, three- and four-story residences and a church to the south, seven-story apartment building to the east, and three-story residential building with retail storefront to the west. Currently, the Site is used as a concrete-paved parking lot and contains no buildings or other Site improvements.

According to information obtained from the New York City Department of Finance (NYCDOF), the Site is identified as Block 1861, Lot119 (formally part of Lot 20, the subdivision became effective August 2012). The Site is listed with E-No. E-185, CEQR No. 07DCP070K, and ULURP No.070447ZMK.

## 1.2 PROPOSED REDEVELOPMENT PLAN

The proposed use of the Site will consist of a new 10-story concrete and brick facade mixed-use rental building located on Fulton Street, in the Bedford Stuyvesant section of Brooklyn, NY. This new development will replace the existing vacant lot, being used as a parking lot, with approximately 14,000 square feet of retail and community facility space and fifty-seven (57) studio, one, two, and three bedroom rental units. The proposed cellar, sub-cellar and 1st floor will encompass the entire lot, 115.21' wide by 100' deep, with the sub-cellar being approximately 23' below grade which is above the groundwater table (groundwater table estimated between 50 to 55 feet below grade). The cellar will be used for commercial space, and vehicle parking. The sub-cellar will be used for vehicle parking, trash room, tenant storage, and bicycle parking. The current zoning designation is C4-5D which is a commercial district that permits residential, commercial, and community facility buildings. Layout of the proposed site development is presented in Figure 2 and Appendix 4. The current zoning designation is C4-5D which is a commercial district that permits residential, commercial, and community facility buildings.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

## 1.3 DESCRIPTION OF SURROUNDING PROPERTY

The surrounding properties are predominately residential and commercial with some manufacturing. Adjacent properties include:

Direction From Site	Address	Occupant(s) Name or Type	Current Use
North, across Fulton Street	1333-1343 Fulton Street	Greater Zion Shiloh Baptist Church, Ride Bicycle Shop, Gourmet Deli, Family Dentistry, Diamond Jewelers	Mixed Use
East	1330 Fulton Street	Seven-story residential apartment building	Residential
South	153-177 Herkimer Street	Three and four-story residences and Daniel Deliverance Spiritual Baptist Church	Residential / Church

West	1318 Fulton Street	DLB Dialloubé Fashions	Commercial
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A daycare facility, Little Sun People Day Care Center, at 1360 Fulton Street, is located approximately 360 feet east of the Site. A public school, William H Prescott P.S. 93, was identified approximately 420 feet southeast of the Site. No hospitals were identified within a 500-foot radius of the Site. Figure 1 shows the surrounding land usage.

#### 1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “*Phase II Environmental Site Investigation Hazardous Materials E-Designation (E-231) of 1328 Fulton Street, Block 1861, Lot 119, Brooklyn, NY 11216*”, dated June 26, 2013, prepared by Cardno ATC.

The scope of this Phase II ESI consisted of the following:

- Contacting “One-Call” subsurface utility mark-out service;
- Preparation of a Site-Specific Health and Safety Plan (HASP) consistent with applicable and appropriate requirements;
- Performance of a geophysical survey;
- The advancement of nine (9) soil borings (*please note that four (4) additional borings attempts were performed at SB-7 and one (1) additional boring attempt at MW-2*) and the collection of 16 soil samples for laboratory analysis;
- The installation of four (4) temporary well points (TWPs) (*please note that one (1) additional boring attempt was performed at MW-2*) and the collection of four (4) groundwater samples for laboratory analysis;
- The collection of five (5) soil vapor samples and one (1) ambient air samples for laboratory analysis;
- The collection of two (2) duplicate samples (one (1) soil and one (1) groundwater) and two (2) trip blanks;

- Survey performed by a New York State Licensed Surveyor which included surveying the casing elevation of each monitoring well in order to determine groundwater flow direction at the Site; and,
- An evaluation of the field and laboratory data and preparation of this report.

The Phase II ESI identified the following:

1. The underlying subsurface consisted of 12 inches of concrete followed by soils consisting of brown fine to medium sand, dark brown sand, and brown sand with one or more of the following man-made materials (brick, wood, metal, and glass fragment), which are indicative of fill material, in each of the borings to depths ranging from eight (8) to 10 feet below ground surface (bgs). Below the identified fill material, the soils consisted of brown fine to medium sand and brown sandy silt to a termination depth of 15 feet bgs.
2. Cardno ATC observed black staining in SB-5 at a shallow depth. The results of the field screening did not identify any photoionization detector (PID) readings or a petroleum odor. No other borings exhibited any PID readings or visual/olfactory indications of impacted soils.
3. On June 5, 2013, Naeva Geophysics Inc., under the observation of Cardno ATC, arrived on-Site to perform a geophysical survey to identify subsurface structures, utilities, and anomalies throughout the Site so that they can be avoided during drilling activities and to investigate the potential presence of underground storage tanks (USTs). The equipment to be used included a Sensors and Software N250Plus cart-mounted Ground Penetrating Radar (GPR) unit with a 250 MHz antenna, a Radiodetection 4000T3 multi-transmitter, a Radiodetection 4000 receiver, and a Fisher TW-6 metallic locator. Naeva Geophysics Inc. began compiling data for the geophysical survey at the time a large rain event occurred. Preliminary data collected as part of the geophysical survey indicated that due to reinforced concrete throughout the Site the penetration of the survey would be limited to less than one (1) foot bgs. Based on the rain event and the preliminary data indicating that the survey would be limited in depth to less than one (1) foot bgs, the survey was not completed since the results would likely be inconclusive. Therefore, the geophysical survey was not able to investigate the potential presence of USTs at the Site.

4. Groundwater was encountered at 48.12 feet bgs in MW-1, 50.20 feet bgs in MW-2, 49.03 feet bgs in MW-3, and 48.75 feet bgs in MW-4. Based on the survey, the apparent groundwater flow direction is west-northwest
5. Soil samples collected during the RI identified trace concentrations volatile organic compound (VOC) including methylene chloride, naphthalene, xylenes and trichloroethylene. One VOC, acetone (max. of 0.11 ppm), exceeded New York State Department of Environmental Conservation (NYSDEC) Subpart 375-6: Remedial Program Restricted Residential Use SCOs. Six semi volatile organic compounds (SVOCs) including benzo(a)anthracene (max. of 18.2 ppm), benzo(a)pyrene (max. of 12.0 ppm), benzo(b)fluoranthene (max. of 15.6 ppm), benzo(k)fluoranthene (max. of 13.1 ppm), chrysene (max. of 17.7 ppm), and indeno(1,2,3-cd)pyrene (max. of 4.72 ppm) were detected above their respective Restricted Residential Use SCOs in seven shallow soil samples. With the exception of SB-7, none of the soil samples collected at depth (12'-14') had SVOCs above their laboratory method detection limits (MDLs). Six metals including barium (max. of 898 ppm), copper (max. of 1640 ppm), lead (1910 ppm), selenium (max. of 4.95 ppm), silver (8.57 ppm) and zinc (max. of 522 ppm) were detected exceeding Unrestricted Use SCOs, and of these, barium, copper and lead also exceeded Restricted Residential SCOs. Most metal exceedances were observed in shallow soil samples. Pesticides were detected in the shallow soil samples and one (1) deep soil sample (SB-7 [12'-14']) above their Unrestricted Use SCO but below their Restricted Residential Use SCO. Five pesticides were detected above Unrestricted Use SCOs including 4,4'-DDD (max. of 0.445 ppm), 4,4'-DDE (max. of 0.186 ppm), 4,4'-DDT (max. of 0.466 ppm), dieldrin (max. of 0.0629 ppm), and eldrin (max. of 0.0443 ppm). Of these pesticides, dieldrin also exceeded Restricted Residential Use SCOs. PCBs were not detected above their laboratory MDLs in the soil samples analyzed. SVOCs, metals and pesticides SCO exceedances in shallow soils appear to be distributed within the historic fill layer and are likely associated with the quality of the fill at the Site.
6. Groundwater samples collected during the RI identified one VOC, methylene chloride (max. of 6.3 ug/L) in each of the groundwater samples slightly above the New York State Department of Environmental Conservation Technical and Operational Guidance

Standard (TOGS) Ambient Water Quality Standards (AWQS) 1.1.1 for Class GA groundwater. . Methylene chloride is a common laboratory contaminant. Trace concentrations of TCE (max. of 4.5 ug/L) and PCE (1.4 ug/L) were also identified in all groundwater samples. The SVOCs fluoranthene, phenanthrene, and pyrene were detected below their corresponding AWQS in MW-4. No other SVOCs were detected above their laboratory MDL in the groundwater samples collected. Several metals were identified but only manganese (max. of 640 ug/L) and sodium (max. of 47600) were detected above their corresponding AWQS. Pesticides and PCBs were not detected above their laboratory MDLs in the groundwater samples analyzed.

7. Soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) values (AGVs). Soil vapor sampling results identified benzene and ethylbenzene at concentrations above the New York State Department of Health (NYSDOH) Background Levels in each the soil vapor samples analyzed. Carbon tetrachloride (max. of 480 ug/m<sup>3</sup>) was detected in two (2) soil vapor samples at concentrations above the NYSDOH Background Levels and EPA Shallow Soil Vapor Value. Soil vapor samples showed several VOCs, including 1,2,4-trimethylbenzene, acetone, carbon disulfide, chlorobenzene, cyclohexane, n-heptane, n-hexane, o-xylene, p- &m-xylene, p-ethyltoluene, toluene, Freon 111 with most compounds at concentrations were below 50 ug/m<sup>3</sup>. Highest reported concentrations were for acetone (540 ug/m<sup>3</sup>), total xylenes (290 ug/m<sup>3</sup>) and toluene (250 ug/m<sup>3</sup>). None of the detected concentrations of compounds in the ambient air sample were above the NYSDOH Background Levels. Chlorinated VOCs including tetrachloroethylene (PCE), trichloroethylene, and TCA were not detected in soil vapor samples.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this site.

## **2.0 REMEDIAL ACTION OBJECTIVES**

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified for this Site:

### **Groundwater**

- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from contaminated groundwater.

### **Soil**

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.

### **Soil Vapor**

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

### 3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process under is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). A remedy is then developed based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Land use; and
- Sustainability.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

**Alternative 1 involves:**

- Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives SCOs.
- Removal of all soil/fill exceeding Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. This alternative would require excavation across the entire site to a minimum depth of 23 feet below ground surface. If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still present at the base of the

excavation, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs. Footings and foundations for the proposed building would be constructed after the removal of contaminated soil and the importation of clean backfill to achieve required grade prior to construction.

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a vapor barrier would be installed beneath the foundation and behind foundation sidewalls of the new building as a part of development to prevent any potential future exposures from off-Site soil vapor.
- Placement of a final cover over the entire Site as part of new development.

**Alternative 2 involves:**

- Establishment of Track 4 Site-Specific SCOs
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Excavation for the planned basement level would take place to a depth of approximately 23 feet bgs. Therefore, if soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to meet Track 4 Site-Specific SCOs.
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Placement of a soil vapor barrier system beneath the building slab and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval; and
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were

intended; and continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by the RAWP.

### **3.1 THRESHOLD CRITERIA**

#### **Protection of Public Health and the Environment**

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing contaminated soil/fill exceeding Track 1 Unrestricted Use SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls, including a composite cover system, and vapor barrier. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls including a Site Management Plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to the contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan (CHASP), a Soil and Materials Management Plan, and Community Air Monitoring Plan (CAMP). Groundwater is (48 feet deep) not expected to be encountered during development, and potential contact with contaminated groundwater would be prevented as its use is prohibited by City laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier system below the new building's basement slab

and continuing the vapor barrier around the foundation walls. Additionally, a ventilated parking garage in new basement would prevent any vapors from accumulating in the new building.

### **3.2. BALANCING CRITERIA**

#### **Compliance with Standards, Criteria and Guidance (SCGs)**

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and ROAs through removal of soil to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's slab and continuing the vapor barrier around the foundations walls, as part of development.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier below the new building's slab and continuing the vapor barrier outside foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-site workers and the surrounding community from exposure to Site-related contaminants.

#### **Short-term effectiveness and impacts**

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental

impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both alternatives 1 and 2 have similar short term effectiveness during their respective implementations, as each requires excavation of all or most historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short term impacts could potentially be higher for the Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 590, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

Both alternatives would employ appropriate measures to prevent short term impacts, including Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Construction Health and Safety Plan (CHASP) would be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

### **Long-term effectiveness and permanence**

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of

remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill and enabling unrestricted usage of the property.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs, by establishing Engineering Controls including a vapor barrier and composite cover system across the Site; by establishing Institutional Controls to ensure long-term management including use restrictions, a Site Management Plan and continued registration as E-designated property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination would also be eliminated as part of the remedy.

### **Reduction of toxicity, mobility, or volume of contaminated material**

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce

the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 would provide maximum reduction of toxicity, mobility and volume of contaminated material on-Site by excavation and removal of all soils that exceed the Track 1 unrestricted use SCOs.

Alternative 2 would remove all or most of the historic fill at the Site, and any remaining on-Site soil beneath the new building will meet Track 4 - Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

The removal of soil to 23 feet for the new development in both scenarios would probably result in relatively minor differences between these two alternatives.

### **Implementability**

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

Both alternatives are both feasible and implementable. They use identical standard materials and services and well established technology. The reliability of each remedy is high. There are no special difficulties associated with any of the activities proposed but will require a long period of time to accomplish due to the large quantity of soil and fill material that would require removal. However, Alternative 1 may require additional shoring to excavate deeper than the new buildings planned excavation depth of 23 feet bgs.

### **Cost effectiveness**

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

Since historic fill at the Site was found during the RI to only extend to a depth of up to 10 feet below grade, and the new building requires excavation of the entire Site to a depth of 23ft, the costs associated with both Alternative 1 and Alternative 2 will likely be the comparable. Costs associated with Alternative 1 could potentially be higher than Alternative 2 if soil with analytes above Unrestricted Use SCOs is encountered below the excavation depth required for development.

Costs associated with both Alternative 1 and 2 are estimated at approximately \$1,009,000. The following items and assumptions were included in this cost estimate:

- Excavation to a depth of 23 feet bgs within a 11,521 ft<sup>2</sup> area;
- Transportation and disposal of 14,720 tons of excavated soil as non-hazardous;
- Backfilling with certified clean fill;
- Installation of vapor barrier beneath building slab;
- HASP and CAMP monitoring for the duration of the remedial activities;
- Post-excavation soil sampling; and
- Remedial Action Report.

Both cost estimates do not include any shoring or stabilization of nearby structures. The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

### **Community Acceptance**

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

Based on the overall goals of the remedial program and initial observations by the project team, both alternatives will be acceptable to the community. This RAWP will be subject to and

undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternative and the selected remedial action. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix 1.

### **Land use**

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. Both alternatives for remedial action at the site are comparable with respect to the proposed use and to land uses in the vicinity of the Site. The proposed use is consistent with the existing zoning designation for the property and is consistent with recent development patterns. The Site is surrounded by residential and commercial properties and the proposed alternative provides comprehensive protection of public health and the environment for these uses. Improvements in the current environmental condition of the property achieved by the alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. The alternatives are equally protective of natural resources and cultural resources. This RAWP will be subject to public review under the NYC VCP and will provide the opportunity for detailed public input on the land use factors described in this section. This public comment will be considered by OER prior to approval of this plan.

## **Sustainability of the Remedial Action**

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix C.

## **4.0 REMEDIAL ACTION**

### **4.1 SUMMARY OF PREFERRED REMEDIAL ACTION**

The preferred remedial action alternative is Alternative 1, the Track 1 Alternative. The preferred remedial action alternatives achieve protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establish Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. For new development, the entire foot print of the site will be excavated to a depth of 23 feet below grade;
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;

8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite;
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
11. As part of development, construction and maintenance of an engineered composite cover consisting of a minimum 6 inch thick cellar parking garage concrete foundation to prevent human exposure to residual soil/fill remaining under the Site;
12. As part of development, installation of a GSE Environmental 20-mil or OER approved equivalent vapor barrier system beneath the building slab and outside foundation sidewalls below grade;
13. As part of development, construction of an ventilated (high volume air exchange) parking garage per NYC Building's codes and regulations;
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;
16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and if Track 1 SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site;
17. If Track 1 Unrestricted Use SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual

contamination, including plans for maintenance, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and

18. If Track 1 Unrestricted Use SCOs are not achieved, the property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

#### **4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT**

Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are listed in Table 1. As a contingency, if Track 1 cleanup cannot be achieved during the remedial action, the site specific SCOs shall be the Restricted Residential SCOs (Track 2), except for the following: SCO for barium will be set at 800 mg/kg, SCO for lead will be set at 1,200 mg/kg, and total semi-volatile organic compounds will be set at 250 mg/kg (Table 2). Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavations is shown in Figure 3.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

#### **Estimated Soil/Fill Removal Quantities**

The total quantity of soil/fill expected to be excavated and disposed off-Site is 14,720 tons.

The proposed disposal locations for Site-derived impacted materials are listed below. Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Clean Earth of New Jersey 115 Jacobus Avenue Kearny, NJ 07032	Soil / Historic Fill	14,720 tons

### **End-Point Sampling**

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Approximately 13 confirmation samples will be collected from the base of the excavation at locations to be determined by OER. For comparison to Track 1 SCOs, analytes will include VOCs, SVOC, pesticides, PCBs and metals according to analytical methods described below. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list, including SVOCs, metals and pesticides only.

The approximate collection location of the confirmation soil samples is shown on Figure 3. The soil sampling and testing will be performed promptly following excavation and will be completed prior to any site development activities.

Hot-spot removal actions, whether established under this RAWP or identified during the remedial program, will be performed in conjunction with post remedial end-point samples to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Frequency for hot-spot end-point sample collection is as follows:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.

2. For excavations 20 to 300 feet in perimeter:

- For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
- For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.

4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation end-point sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

New York State ELAP certified labs will be used for all confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be Confirmation samples will be analyzed for compounds and elements as described above utilizing the following methodology:

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;

- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and “finger print analysis” and required regulatory reporting (i.e. spills hotline) will be performed.

### **Quality Assurance/Quality Control**

Samples will be collected into the appropriate containers provided by the laboratory, placed in a cooler, and shipped via overnight courier to the laboratory under proper chain-of-custody procedures. Samples will be preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

Disposable sampling equipment will be used for the collection of end-point samples; therefore, no field (rinsate) blanks will be generated. However, if non-disposal sampling equipment is used, field rinsate blanks will be prepared at a rate of one for every 10 samples collected. Sampling equipment will be properly decontaminated prior to reuse. Trip blanks will be used if VOC samples are collected for analysis. Trip blanks will not be required for samples analyzed for SVOCs, metals, PCBs or pesticides. One blind duplicate sample will be collected and submitted for analysis every 20 samples.

### **Import and Reuse of Soils**

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3. It is not anticipated that any topsoil will be imported into the Site for backfill and/or cover soil.

## **4.3 ENGINEERING CONTROLS**

The excavation required for the proposed Site development will achieve Track 1 Unrestricted Use SCOs. No Engineering Controls are required to address residual contamination at the Site. However, the following elements will be incorporated into the foundation design as part of the development: composite cover system, ventilated garage and soil vapor barrier. If

Track 1 is not achieved, these elements will constitute Engineering Controls that will be employed in the remedial action to address residual contamination remaining at the Site.

### **Composite Cover System**

As part of new development, the entire property will be covered by an engineered permanent cover system. This composite cover system is comprised of a minimum 6-inch thick concrete foundation and slab beneath the area of the proposed building that occupies the entire footprint of the property. Figure 4 shows the typical design for the remedial cover system used on this Site.

If Track 1 SCO's are not achieved at the Site, the composite cover system will be a permanent engineering control. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

#### **o Vapor Barrier**

As part of development, migration of potential soil vapors into the building will be prevented with the combined installation of the concrete cellar foundation slab and vapor barrier. The cellar will be used for vehicle parking, utility rooms and commercial storage. A vapor barrier will be installed over the sub-base material prior to pouring the building foundation slab. The vapor barrier will extend over the entire footprint of the building to be constructed on-Site and consist of the 20 mil HDPE geomembrane manufactured by GSE Environmental or equivalent. Installation specifications will be provided to the construction management company and the installer of the geomembrane. All vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, in accordance with the manufacturer's recommendations and instructions.

Figure 4 illustrates the extent of the proposed vapor barrier membrane. Installation details with respect to the proposed building foundation, footings, exterior foundation wall, etc. are provided in Figure 5. Product Manufacturer specifications are provided in Appendix 5.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The Remedial Action Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

○ **High Volume Ventilation of Parking Area**

Potential soil vapor intrusion will also be mitigated by installing a high volume air exchange in the sub grade parking area as part of construction to meet the NYC Building Code.

#### **4.4 INSTITUTIONAL CONTROLS**

Track 1 remedial actions do not require Engineering Controls. If Track 1 SCOs are not achieved, Institutional Controls (IC) will be utilized in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. The property will continue to be registered with an E-Designation by the NYC Buildings Department.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that

constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determined by OER in the SMP and will comply with RCNY §43-1407(1)(3).

- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for usage type: residential and commercial use and will not be used for a higher level of use without prior approval by OER.

#### **4.5 SITE MANAGEMENT PLAN**

Site Management is not required for Track 1 remedial actions. However, if Track 1 SCOs are not achieved, Site Management will be the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Brownfield Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 31 of the year following the reporting period.

#### **4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT**

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

##### **Known and Potential Sources**

Historic fill is present on Site to a depth of up to 10 feet below grade. Based on the results of the Remedial Investigation Report, the contaminants of concern found are:

##### **Soil:**

- SVOCs, including; benzo(a)anthracene , benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected above Restricted Residential Use SCOs; and
- Metals including; barium, copper and lead were detected above Restricted Residential SCOs.

- Pesticides including; 4,4'-DDD, 4,4'-DDE, 4,4'-DDT and Endrin were detected above Unrestricted Use SCOs.

**Groundwater:**

- Methylene chloride was detected and exceeded GQS; and
- Metals including iron, manganese, and sodium were detected above GQS

**Soil Vapor:**

- Low levels of petroleum related VOCs were detected in all soil vapor samples; and
- Chlorinated VOCs including tetrachloroethylene (PCE), trichloroethylene, and TCA were not detected in soil vapor samples..

**Nature, Extent, Fate and Transport of Contaminants**

SVOCs, metals and pesticides are present throughout the Site in the shallow soils associated with the historic fill material. Low concentrations of methylene chloride and metals appeared to be present in the shallow groundwater throughout the Site. Low levels of petroleum related vapors were detected in soil vapors. The chlorinated VOCs in soil vapor were not detected or were well below guidance issued by New York State DOH and were not found in any of the on-Site soil or groundwater samples collected.

**Potential Routes of Exposure**

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of water, fill or soil;
- Inhalation of vapors and particulates; and
- Dermal contact with soil.

### **Existence of Human Health Exposure**

Current Conditions: The potential for exposure to historic fill is limited due to an asphalt cap constructed over the entire lot. Groundwater is marginally contaminated but is not exposed at the Site, and because the Site is served by the public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential exposure.

Construction/ Remediation Activities: Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils and groundwater, as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4 Site Specific SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place. Potential post-remediation exposures to on-Site residents from soil vapors migrating on-Site from an off-Site source remain a concern after the remedial action. A waterproofing membrane/vapor barrier system will prevent any exposure to existing and potential soil vapors in the future and any potential intrusion will be mitigated by a high volume air exchange in the basement parking area. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

## **Receptor Populations**

On-Site Receptors - The Site is currently a capped parking lot. Onsite receptors are limited to commuters, trespassers, and site representatives. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents, workers and visitors.

Off-Site Receptors - Potential off-Site receptors within a 0.25-mile radius of the Site include: adult and child residents, and commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Residential Buildings (up to 0.25 mile) – existing and future
3. Building Construction/Renovation (up to 0.25 mile) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
5. Schools (up to .25 mile) – existing and future

## **Overall Human Health Exposure Assessment**

The QHHEA indicated that potential exposure pathways appear to exist only during the current unremediated phase and during the remedial action phase. There is no complete exposure pathway under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide impervious surface cover cap, and a subsurface vapor barrier system for the building. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. During remedial construction, on-site and off-site exposures to dust from contaminated soils will be addressed through dust controls, and through the implementation of the community air monitoring program and a construction health and safety plan.

After the remedial action is complete, there will be no remaining exposure pathways. The composite cover system, vapor barrier system, and long-term site management (if required) will prevent any remaining exposure pathways from being complete. As part of the development, a parking garage at the base level of the building will be ventilated in conformance with NYC

Building Code. This construction activity will prevent migration of fugitive soil vapors from entering the building.

## **5.0 REMEDIAL ACTION MANAGEMENT**

### **5.1 PROJECT ORGANIZATION AND OVERSIGHT**

Principal personnel who will participate in the remedial action include Messrs. Jed A. Myers, Ph.D., Senior Project Manager, and John Mascioli, M.S., Project Manager of Cardno ATC. The aforementioned personnel will provide oversight and consultation regarding the remedial action. Messrs. Robert Harrington, CIH, Senior Project Manager of Cardno ATC and Michael Donovan, CIH, Senior Project Manager of Cardno ATC will provide consultation regarding the CAMP. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Mr. Gilbert Gedeon, P.E., Division Manager of Cardno ATC and John Mascioli, M.S., Project Manager of Cardno ATC, respectively.

### **5.2 SITE SECURITY**

Site access will be controlled by gated entrances to the fenced Site.

### **5.3 WORK HOURS**

The hours for operation of remedial construction will be from 7 AM to 4 PM. These hours conform to the New York City Department of Buildings construction code requirements.

### **5.4 CONSTRUCTION HEALTH AND SAFETY PLAN**

The Health and Safety Plan is included in Appendix 4. The Site Safety Coordinator will be Gabriel Richardson with Safety Dynamics. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in

compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use in case of emergency.

## **5.5 COMMUNITY AIR MONITORING PLAN**

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous

monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

### **VOC Monitoring, Response Levels, and Actions**

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

### **Particulate Monitoring, Response Levels, and Actions**

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ( $\text{mcg}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed  $150 \text{ mcg}/\text{m}^3$  above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than  $150 \text{ mcg}/\text{m}^3$  above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within  $150 \text{ mcg}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

## **5.6 AGENCY APPROVALS**

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

## **5.7 SITE PREPARATION**

### **Pre-Construction Meeting**

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

### **Mobilization**

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

### **Utility Marker Layouts, Easement Layouts**

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed in compliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

## **Dewatering**

No dewatering is anticipated during the construction of the proposed building.

## **Equipment and Material Staging**

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations.

## **Stabilized Construction Entrance**

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

## **Truck Inspection Station**

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC VCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

## **Extreme Storm Preparedness and Response Contingency Plan**

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

### **Storm Preparedness**

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, haybales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

### **Storm Response**

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and

corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

### **Storm Response Reporting**

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website ([www.nyc.gov/oer](http://www.nyc.gov/oer)) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

## **5.8 TRAFFIC CONTROL**

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is shown in the directions included as Appendix 6.

## **5.9 DEMOBILIZATION**

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

## **5.10 REPORTING AND RECORD KEEPING**

### **Daily Reports**

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;

- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

### **Record Keeping and Photo-Documentation**

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

## **5.11 COMPLAINT MANAGEMENT**

All complaints from citizens will be promptly reported to OER. Complaints will be addressed and outcomes will also be reported to OER in daily reports. Notices to OER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

## **5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN**

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be

followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

## 6.0 REMEDIAL ACTION REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continue registration of the property with an E-Designation at the NYC Department of Buildings.
- Reports and supporting material will be submitted in digital form.

## Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

*I, Gilbert Gedeon, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Fulton South Site 13EH-A393K.*

*I, John Mascioli, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Fulton South Site 13EH-A393K. (Optional)*

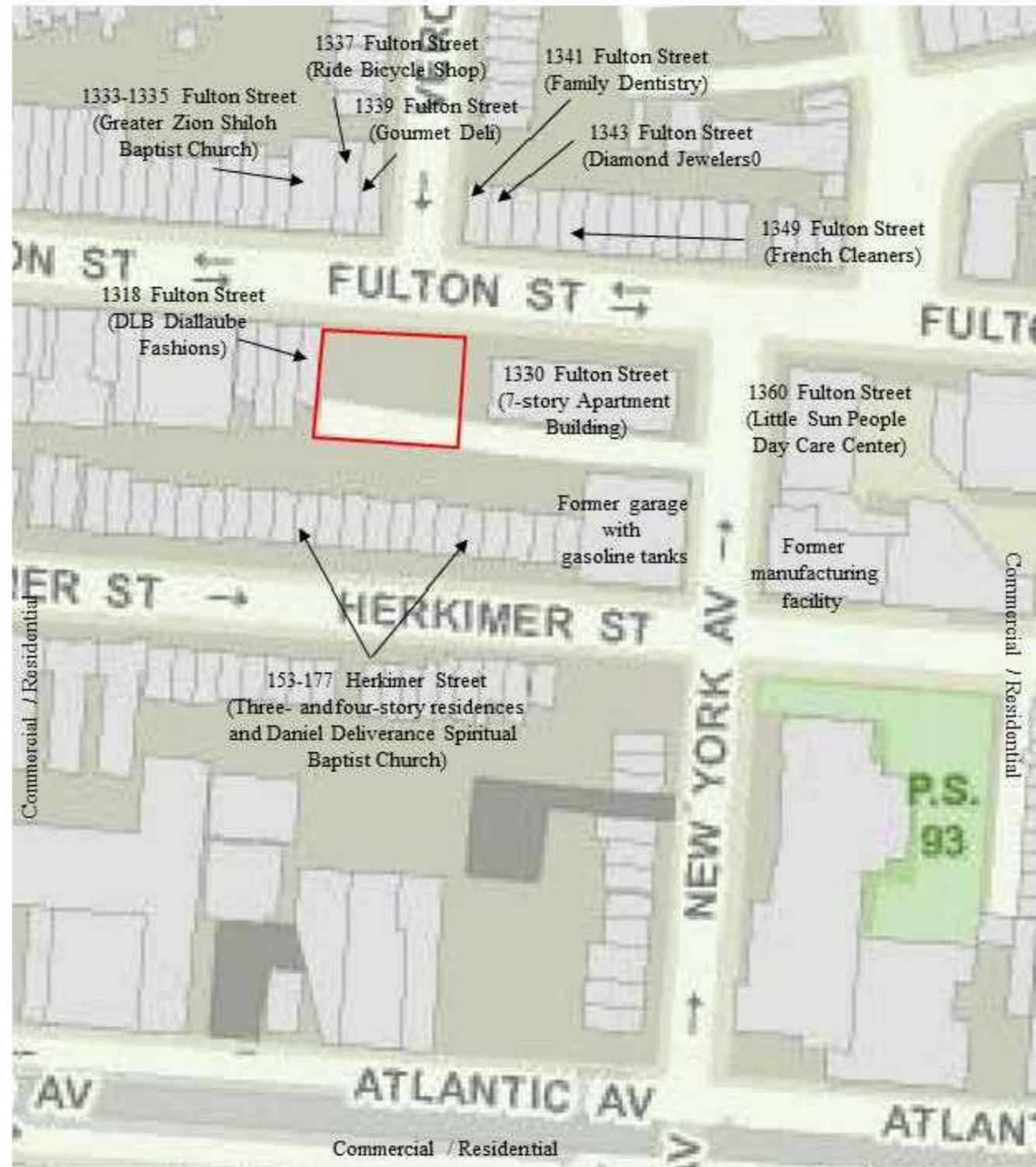
*I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.*

## 7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 21 month remediation period is anticipated.

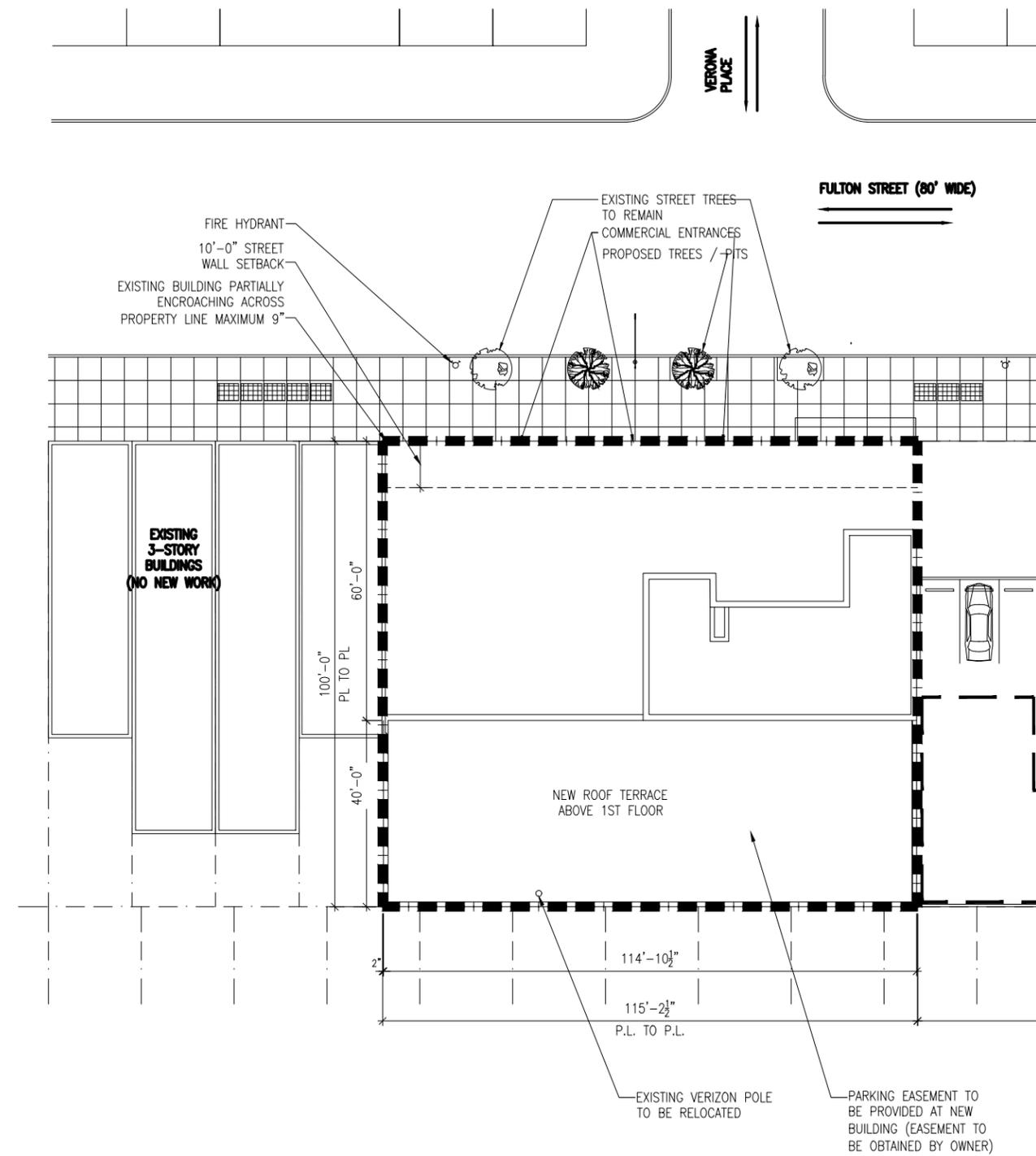
<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	6
Remedial Excavation	7	12
Demobilization	23	2
Submit Remedial Action Report	25	6

## **FIGURES**

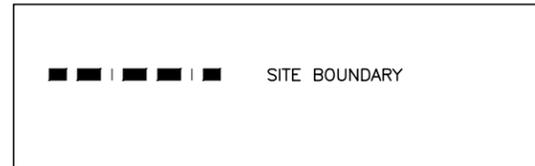


SITE LOCATION PLAN

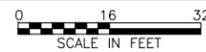
CLIENT: <b>FULTON SOUTH DEVELOPMENT LLC</b>	SITE ADDRESS: 1328 FULTON STREET, BROOKLYN, NY 11216	 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306	DRAWING BY: N.KOGELMAN	DRAWING TITLE: <b>SITE LOCATION PLAN</b>	DRAWING NO. <b>FIG-1</b>
			INSPECTED BY: J. MYERS		SHT. 1 OF 6
			DESIGNED BY: J. MYERS		DATE: 11.07.13
			CHECKED BY: J. MASCIOLI	SCALE: AS SHOWN	ATC PROJECT: # 15.38242.0025
					REVISION No. 0



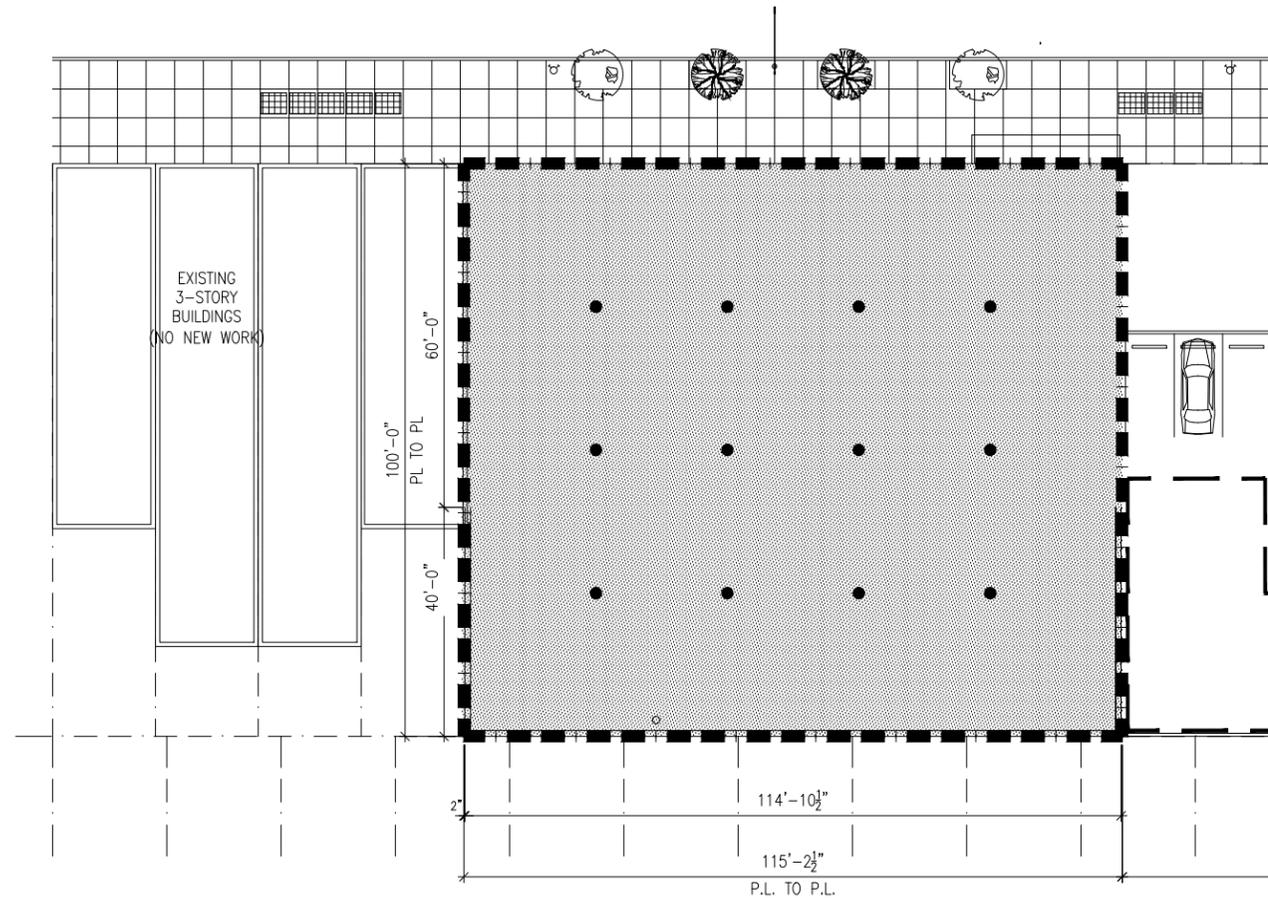
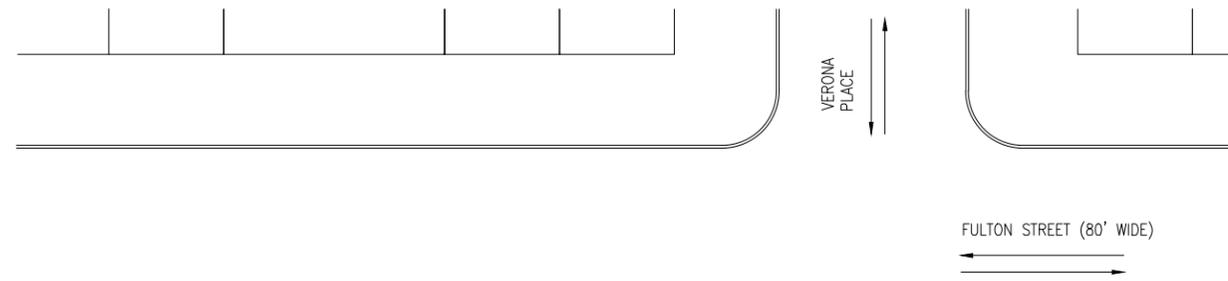
**LEGEND:**



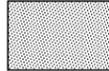
**SITE LOCATION PLAN**



CLIENT:  <b>FULTON SOUTH DEVELOPMENT LLC</b>	SITE ADDRESS:  1328 FULTON STREET, BROOKLYN, NY 11216	 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306	DRAWING BY: N.KOGELMAN	DRAWING TITLE:  <b>PROPOSED SITE DEVELOPMENT</b>	DRAWING NO. <b>FIG-2</b>
			INSPECTED BY: J. MYERS		SH. 2 OF 6
			DESIGNED BY: J. MYERS		DATE: 11.07.13
			CHECKED BY: J. MASCIOLI	SCALE: AS SHOWN	REVISION No. 0
				ATC PROJECT: # 15.38242.0025	



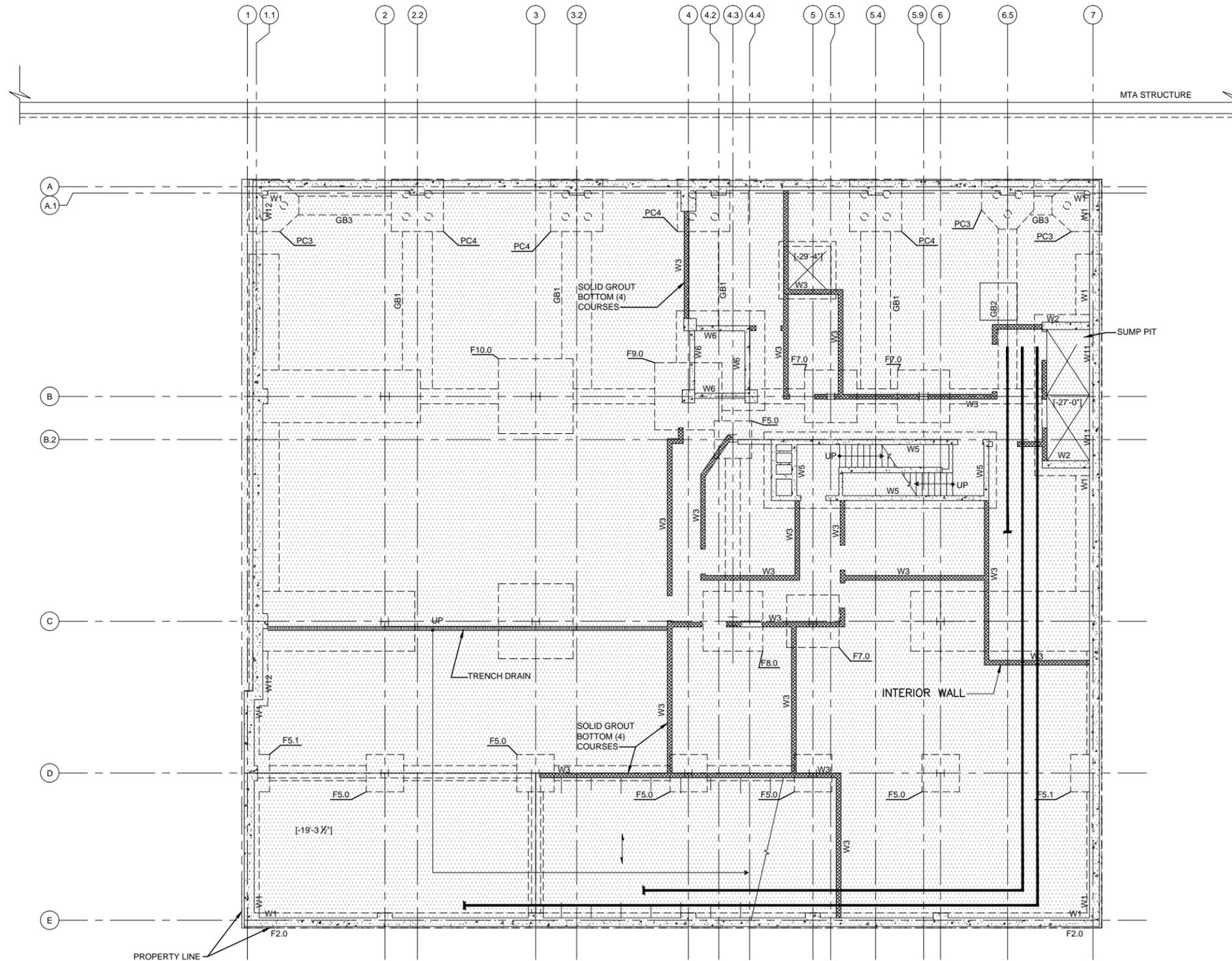
**LEGEND:**

	PLANNED EXCAVATION AREA
	END-POINT SOIL SAMPLE LOCATION (APPROXIMATE)

**SITE LOCATION PLAN**



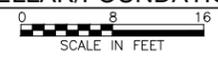
CLIENT:  <b>FULTON SOUTH DEVELOPMENT LLC</b>	SITE ADDRESS:  1328 FULTON STREET, BROOKLYN, NY 11216	 Shaping the Future 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306	DRAWING BY: N.KOGELMAN	DRAWING TITLE:  <b>PLANNED EXCAVATION AREA AND APPROXIMATE END-POINT SOIL SAMPLING LOCATIONS</b>	DRAWING NO. <b>FIG-3</b>
			INSPECTED BY: J. MYERS		SHT. 3 OF 6
			DESIGNED BY: J. MYERS	DATE: 11.07.13	REVISION No. 0
			CHECKED BY: J. MASCIOLI	SCALE: AS SHOWN	ATC PROJECT: # 15.38242.0025



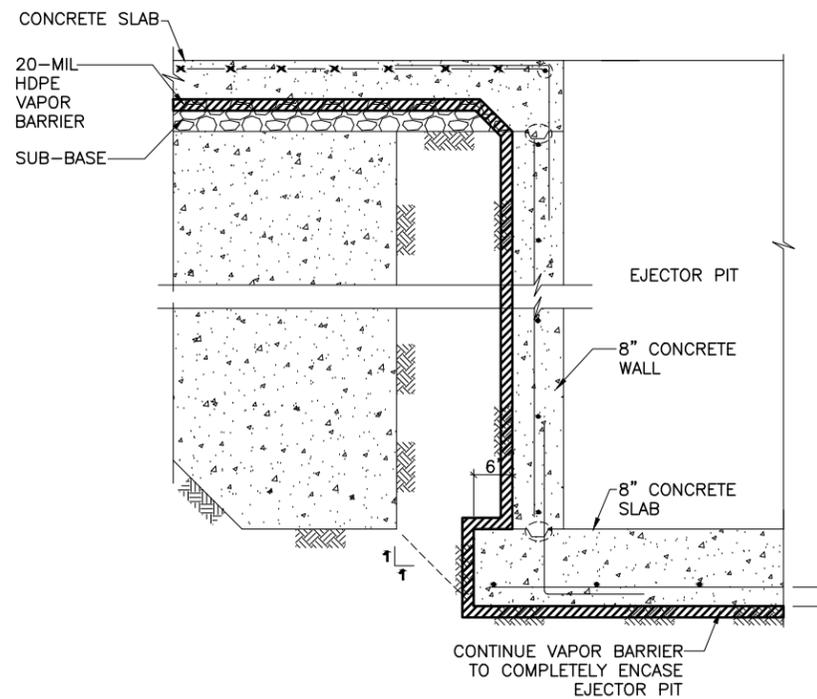
**LEGEND:**

	COMPOSITE COVER SYSTEM CONSISTING OF SUB-CELLAR CONCRETE FOUNDATION AND 20-MIL VAPOR BARRIER
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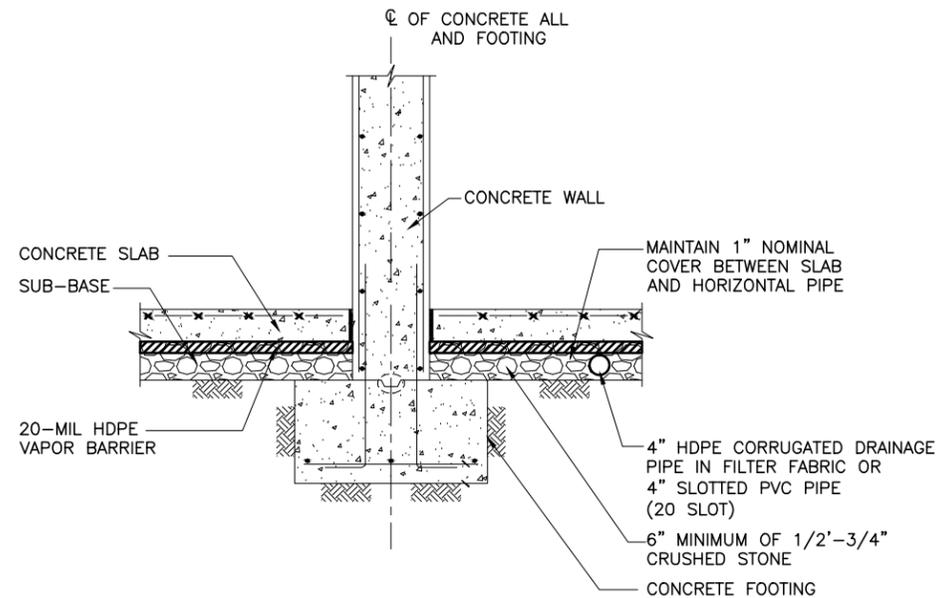
**SUB-CELLAR/FOUNDATION PLAN**



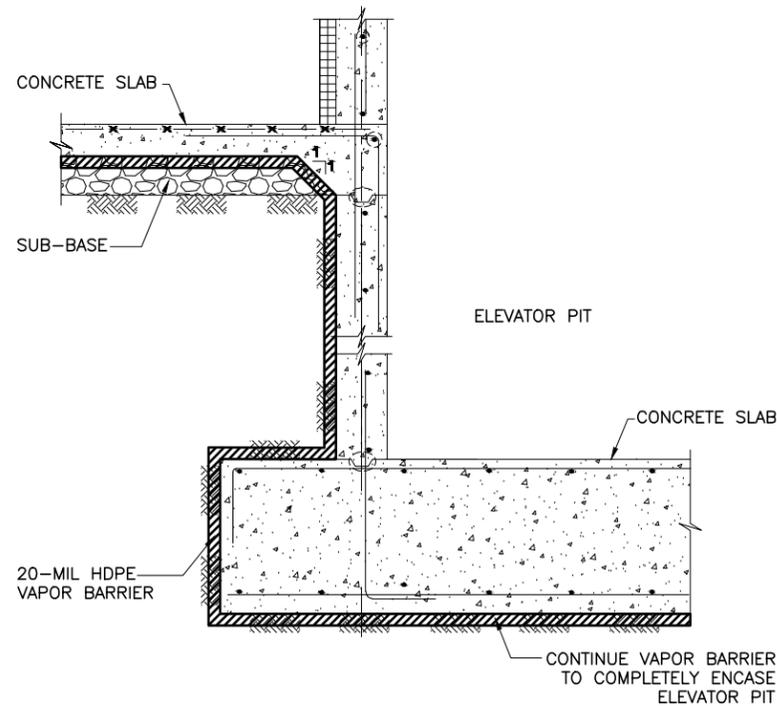
<p>CLIENT:</p> <p style="text-align: center; font-size: 1.2em;"><b>FULTON SOUTH DEVELOPMENT LLC</b></p>	<p>SITE ADDRESS:</p> <p style="text-align: center;">1328 FULTON STREET, BROOKLYN, NY 11216</p>	<p style="font-size: 0.8em;">104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306</p>	<p>DRAWING BY: N.KOGELMAN</p> <p>INSPECTED BY: J. MYERS</p> <p>DESIGNED BY: J. MYERS</p> <p>CHECKED BY: J. MASCIOLI</p>	<p>DRAWING TITLE:</p> <p style="text-align: center; font-size: 1.1em;"><b>COMPOSITE COVER SYSTEM LAYOUT</b></p> <p>SCALE: AS SHOWN</p> <p>ATC PROJECT: # 15.38242.0025</p>	<p>DRAWING NO.</p> <p style="text-align: center; font-size: 1.2em;"><b>FIG-4</b></p> <p>SHT. 4 OF 6</p> <p>DATE: 11.07.13</p> <p>REVISION No. 0</p>
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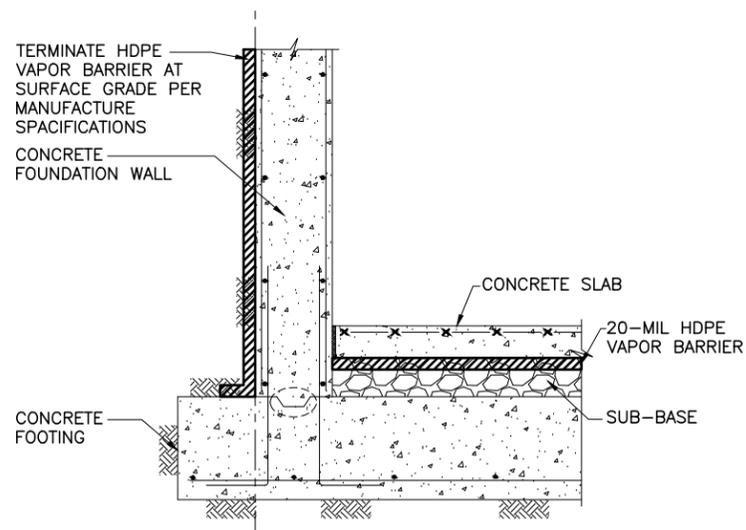
TYPICAL EJECTOR PIT  
NOT TO SCALE



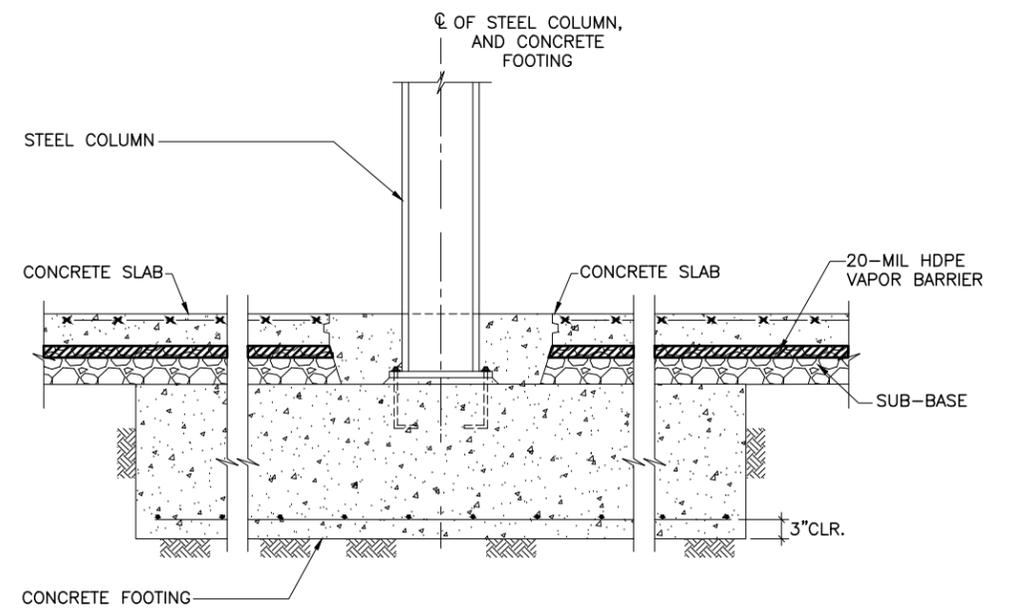
TYPICAL CONCRETE WALL FOOTING  
NOT TO SCALE



TYPICAL ELEVATOR PIT  
NOT TO SCALE



TYPICAL EXTERIOR CONCRETE FOUNDATION WALL  
NOT TO SCALE



TYPICAL INTERIOR COLUMN FOOTING  
NOT TO SCALE

CLIENT:

FULTON SOUTH  
DEVELOPMENT LLC

SITE ADDRESS:

1328 FULTON STREET,  
BROOKLYN, NY 11216



104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010  
TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: N.KOGELMAN  
INSPECTED BY: J. MYERS  
DESIGNED BY: J. MYERS  
CHECKED BY: J. MASCIOLI

DRAWING TITLE:

VAPOR BARRIER INSTALLATION  
DETAILS

SCALE:  
AS SHOWN

ATC PROJECT: # 15.38242.0025

DRAWING NO. FIG-5  
SHT. 5 OF 6  
DATE: 11.07.13  
REVISION No. 0

## **TABLES**

**TABLE 1**  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PART 375**  
**UNRESTRICTED USE SOIL CLEAN UP OBJECTIVES**

<b>METALS</b>		
Arsenic	7440-38-2	13 <sup>c</sup>
Barium	7440-39-3	350 <sup>c</sup>
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5 <sup>c</sup>
Chromium, hexavalent <sup>e</sup>	18540-29-9	1 <sup>b</sup>
Chromium, trivalent <sup>e</sup>	16065-83-1	30 <sup>c</sup>
Copper	7440-50-8	50
Total Cyanide <sup>e, f</sup>		27
Lead	7439-92-1	63 <sup>c</sup>
Manganese	7439-96-5	1600 <sup>c</sup>
Total Mercury		0.18 <sup>c</sup>
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9 <sup>c</sup>
Silver	7440-22-4	2
Zinc	7440-66-6	109 <sup>c</sup>
<b>PCBs / PESTICIDES</b>		
2,4,5-TP Acid (Silvex) <sup>f</sup>	93-72-1	3.8
4,4'-DDE	72-55-9	0.0033 <sup>b</sup>
4,4'-DDT	50-29-3	0.0033 <sup>b</sup>
4,4'-DDD	72-54-8	0.0033 <sup>b</sup>
Aldrin	309-00-2	0.005 <sup>c</sup>
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.036
Chlordane (alpha)	5103-71-9	0.094
delta-BHC <sup>g</sup>	319-86-8	0.04
Dibenzofuran <sup>f</sup>	132-64-9	7
Dieldrin	60-57-1	0.005 <sup>c</sup>
Endosulfan I <sup>d, f</sup>	959-98-8	2.4
Endosulfan II <sup>d, f</sup>	33213-65-9	2.4
Endosulfan sulfate <sup>d, f</sup>	1031-07-8	2.4
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.042
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	0.1

**TABLE 1**  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PART 375**  
**UNRESTRICTED USE SOIL CLEAN UP OBJECTIVES**

<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>		
Acenaphthene	83-32-9	20
Acenaphthylene <sup>f</sup>	208-96-8	100 <sup>a</sup>
Anthracene <sup>f</sup>	120-12-7	100 <sup>a</sup>
Benz(a)anthracene <sup>f</sup>	56-55-3	1 <sup>c</sup>
Benzo(a)pyrene	50-32-8	1 <sup>c</sup>
Benzo(b)fluoranthene <sup>f</sup>	205-99-2	1 <sup>c</sup>
Benzo(g,h,i)perylene <sup>f</sup>	191-24-2	100
Benzo(k)fluoranthene <sup>f</sup>	207-08-9	0.8 <sup>c</sup>
Chrysene <sup>f</sup>	218-01-9	1 <sup>c</sup>
Dibenz(a,h)anthracene <sup>f</sup>	53-70-3	0.33 <sup>b</sup>
Fluoranthene <sup>f</sup>	206-44-0	100 <sup>a</sup>
Fluorene	86-73-7	30
Indeno(1,2,3-cd)pyrene <sup>f</sup>	193-39-5	0.5 <sup>c</sup>
m-Cresol <sup>f</sup>	108-39-4	0.33 <sup>b</sup>
Naphthalene <sup>f</sup>	91-20-3	12
o-Cresol <sup>f</sup>	95-48-7	0.33 <sup>b</sup>
p-Cresol <sup>f</sup>	106-44-5	0.33 <sup>b</sup>
Pentachlorophenol	87-86-5	0.8 <sup>b</sup>
Phenanthrene <sup>f</sup>	85-01-8	100
Phenol	108-95-2	0.33 <sup>b</sup>
Pyrene <sup>f</sup>	129-00-0	100
<b>VOLATILE ORGANIC COMPOUNDS</b>		
1,1,1-Trichloroethane <sup>f</sup>	71-55-6	0.68
1,1-Dichloroethane <sup>f</sup>	75-34-3	0.27
1,1-Dichloroethene <sup>f</sup>	75-35-4	0.33
1,2-Dichlorobenzene <sup>f</sup>	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.02 <sup>c</sup>
cis -1,2-Dichloroethene <sup>f</sup>	156-59-2	0.25
trans-1,2-Dichloroethene <sup>f</sup>	156-60-5	0.19
1,3-Dichlorobenzene <sup>f</sup>	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1 <sup>b</sup>
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene <sup>f</sup>	104-51-8	12

**TABLE 1**  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PART 375**  
**UNRESTRICTED USE SOIL CLEAN UP OBJECTIVES**

VOLATILE ORGANIC COMPOUNDS		
Carbon tetrachloride <sup>f</sup>	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene <sup>f</sup>	100-41-4	1
Hexachlorobenzene <sup>f</sup>	118-74-1	0.33 <sup>b</sup>
Methyl ethyl ketone	78-93-3	0.12
Methyl tert-butyl ether <sup>f</sup>	1634-04-4	0.93
Methylene chloride	75-09-2	0.05
n - Propylbenzene <sup>f</sup>	103-65-1	3.9
sec-Butylbenzene <sup>f</sup>	135-98-8	11
tert-Butylbenzene <sup>f</sup>	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene <sup>f</sup>	95-63-6	3.6
1,3,5-Trimethylbenzene <sup>f</sup>	108-67-8	8.4
Vinyl chloride <sup>f</sup>	75-01-4	0.02
Xylene (mixed)	1330-20-7	0.26

All soil cleanup objectives (SCOs) are in parts per million (ppm).

Footnotes

<sup>a</sup> The SCOs for unrestricted use were capped at a maximum value of 100 ppm. See Technical Support Document (TSD), section 9.3.

<sup>b</sup> For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.

<sup>c</sup> For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.

<sup>d</sup> SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.

<sup>e</sup> The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

<sup>f</sup> Protection of ecological resources SCOs were not developed for contaminants identified in Table 375-6.8(b) with "NS". Where such contaminants appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources SCO according to the TSD.

**TABLE 2**  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PART 375 RESTRICTED USE**  
**SOIL CLEAN UP OBJECTIVES**

Contaminant	CAS NUMBER	Protection of Public Health			
		Residential	Restricted Residential	Commercial	Industrial
<b>METALS</b>					
Arsenic	7440-38-2	16 <sup>f</sup>	16 <sup>f</sup>	16 <sup>f</sup>	16 <sup>f</sup>
Barium	7440-39-3	350 <sup>f</sup>	400	400	10,000 <sup>d</sup>
Beryllium	7440-41-7	14	72	590	2,700
Cadmium	7440-43-9	2.5 <sup>f</sup>	4.3	9.3	60
Chromium, hexavalent <sup>h</sup>	18540-29-9	22	110	400	800
Chromium, trivalent <sup>h</sup>	16065-83-1	36	180	1,500	6,800
Copper	7440-50-8	270	270	270	10,000 <sup>d</sup>
Total Cyanide <sup>h</sup>		27	27	27	10,000 <sup>d</sup>
Lead	7439-92-1	400	400	1,000	3,900
Manganese	7439-96-5	2,000 <sup>f</sup>	2,000 <sup>f</sup>	10,000 <sup>d</sup>	10,000 <sup>d</sup>
Total Mercury		0.81 <sup>i</sup>	0.81 <sup>i</sup>	2.8 <sup>j</sup>	5.7 <sup>j</sup>
Nickel	7440-02-0	140	310	310	10,000 <sup>d</sup>
Selenium	7782-49-2	36	180	1,500	6,800
Silver	7440-22-4	36	180	1,500	6,800
Zinc	7440-66-6	2200	10,000 <sup>d</sup>	10,000 <sup>d</sup>	10,000 <sup>d</sup>
<b>PCBs/PESTICIDES</b>					
2,4,5-TP Acid (Silvex)	93-72-1	58	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
4,4'-DDE	72-55-9	1.8	8.9	62	120
4,4'-DDT	50-29-3	1.7	7.9	47	94
4,4'-DDD	72-54-8	2.6	13	92	180
Aldrin	309-00-2	0.019	0.097	0.68	1.4
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8
beta-BHC	319-85-7	0.072	0.36	3	14
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47
delta-BHC	319-86-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Dibenzofuran	132-64-9	14	59	350	1,000 <sup>c</sup>
Dieldrin	60-57-1	0.039	0.2	1.4	2.8
Endosulfan I	959-98-8	4.8 <sup>i</sup>	24 <sup>i</sup>	200 <sup>i</sup>	920 <sup>i</sup>
Endosulfan II	33213-65-9	4.8 <sup>i</sup>	24 <sup>i</sup>	200 <sup>i</sup>	920 <sup>i</sup>
Endosulfan sulfate	1031-07-8	4.8 <sup>i</sup>	24 <sup>i</sup>	200 <sup>i</sup>	920 <sup>i</sup>
Endrin	72-20-8	2.2	11	89	410
Heptachlor	76-44-8	0.42	2.1	15	29
Lindane	58-89-9	0.28	1.3	9.2	23
Polychlorinated biphenyls	1336-36-3	1	1	1	25
<b>SEMIVOLATILES</b>					
Acenaphthene	83-32-9	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Acenaphthylene	208-96-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Anthracene	120-12-7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Benz(a)anthracene	56-55-3	1 <sup>f</sup>	1 <sup>f</sup>	5.6	11
Benzo(a)pyrene	50-32-8	1 <sup>f</sup>	1 <sup>f</sup>	1 <sup>f</sup>	1.1
Benzo(b)fluoranthene	205-99-2	1 <sup>f</sup>	1 <sup>f</sup>	5.6	11
Benzo(g,h,i)perylene	191-24-2	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>

**TABLE 2**  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PART 375 RESTRICTED USE**  
**SOIL CLEAN UP OBJECTIVES**

Contaminant	CAS NUMBER	Protection of Public Health			
		Residential	Restricted Residential	Commercial	Industrial
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110
Chrysene	218-01-9	1 <sup>f</sup>	3.9	56	110
Dibenz(a,h)anthracene	53-70-3	0.33 <sup>e</sup>	0.33 <sup>e</sup>	0.56	1.1
Fluoranthene	206-44-0	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Fluorene	86-73-7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Indeno(1,2,3-cd)pyrene	193-39-5	0.5 <sup>f</sup>	0.5 <sup>f</sup>	5.6	11
m-Cresol	108-39-4	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Naphthalene	91-20-3	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
o-Cresol	95-48-7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
p-Cresol	106-44-5	34	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55
Phenanthrene	85-01-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Phenol	108-95-2	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Pyrene	129-00-0	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
<b>VOLATILES</b>					
1,1,1-Trichloroethane	71-55-6	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
1,1-Dichloroethane	75-34-3	19	26	240	480
1,1-Dichloroethene	75-35-4	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
1,2-Dichlorobenzene	95-50-1	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60
cis-1,2-Dichloroethene	156-59-2	59	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
trans-1,2-Dichloroethene	156-60-5	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
1,3-Dichlorobenzene	541-73-1	17	49	280	560
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250
1,4-Dioxane	123-91-1	9.8	13	130	250
Acetone	67-64-1	100 <sup>a</sup>	100 <sup>b</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Benzene	71-43-2	2.9	4.8	44	89
Butylbenzene	104-51-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Carbon tetrachloride	56-23-5	1.4	2.4	22	44
Chlorobenzene	108-90-7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Chloroform	67-66-3	10	49	350	700
Ethylbenzene	100-41-4	30	41	390	780
Hexachlorobenzene	118-74-1	0.33 <sup>e</sup>	1.2	6	12
Methyl ethyl ketone	78-93-3	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Methyl tert-butyl ether	1634-04-4	62	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Methylene chloride	75-09-2	51	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
n-Propylbenzene	103-65-1	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
sec-Butylbenzene	135-98-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
tert-Butylbenzene	98-06-6	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>
Tetrachloroethene	127-18-4	5.5	19	150	300
Toluene	108-88-3	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>

**TABLE 2**  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) PART 375 RESTRICTED USE**  
**SOIL CLEAN UP OBJECTIVES**

Contaminant	CAS NUMBER	Protection of Public Health			
		Residential	Restricted Residential	Commercial	Industrial
Trichloroethene	79-01-6	10	21	200	400
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380
Vinyl chloride	75-01-4	0.21	0.9	13	27
Xylene (mixed)	1330-20-7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified. See Technical Support Document (TSD). Footnotes

<sup>a</sup> The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm.

See TSD section 9.3.

<sup>b</sup> The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

<sup>c</sup> The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

<sup>d</sup> The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

<sup>e</sup> For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL),

the CRQL is used as the SCO value.

<sup>f</sup> For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

<sup>g</sup> This SCO is derived from data on mixed isomers of BHC.

<sup>h</sup> The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

<sup>i</sup> This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

<sup>j</sup> This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

# **APPENDIX 1**

## **CITIZEN PARTICIPATION PLAN**

The NYC Office of Environmental Remediation and Fulton South Development LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, Fulton South Development LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Horace Zhang, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841

**Project Contact List.** OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project

manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at [brownfields@cityhall.nyc.gov](mailto:brownfields@cityhall.nyc.gov).

**Repositories.** A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Fulton South Development LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Bedford Branch Library,  
496 Franklin Avenue, Brooklyn, New York  
718-623-0012

Hours of Operation: Tuesday, Thursday and Friday 10:00 AM to 6:00 PM; Wednesday 10:00 AM to 8:00 PM; Saturday 10:00 AM to 5:00 PM; Sunday and Monday closed

**Digital Documentation.** NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

**Identify Issues of Public Concern.** Enrollee is not aware of any issues of public concern at the present time.

**Public Notice and Public Comment.** Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Fulton South Development LLC, reviewed and approved by OER prior to distribution and mailed by Fulton South Development LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

**Citizen Participation Milestones.** Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

**PUBLIC NOTICE IN THE FORM OF A FACT SHEET IS SENT TO ALL PARTIES LISTED ON THE SITE CONTACT LIST ANNOUNCING THE COMPLETION OF REMEDIATION, PROVIDING A LIST OF ALL INSTITUTIONAL AND ENGINEERING CONTROLS IMPLEMENTED FOR TO THE SITE AND ANNOUNCING THE ISSUANCE OF THE NOTICE OF COMPLETION.**

## **APPENDIX 2**

### **SUSTAINABILITY STATEMENT**

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

**Reuse of Clean, Recyclable Materials.** Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

**Reduce Consumption of Virgin and Non-Renewable Resources.** Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

**Reduced Energy Consumption and Promotion of Greater Energy Efficiency.** Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

**Conversion to Clean Fuels.** Use of clean fuel improves NYC's air quality by reducing harmful emissions.

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

**Recontamination Control.** Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

**Storm-water Retention.** Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

**Linkage with Green Building.** Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

**Paperless Brownfield Cleanup Program.** Fulton South Development LLC is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

**Low-Energy Project Management Program.** Fulton South Development LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as

videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

**Trees and Plantings.** Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

## **APPENDIX 3**

### **SOIL/MATERIALS MANAGEMENT PLAN**

#### **1.1 SOIL SCREENING METHODS**

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

#### **1.2 STOCKPILE METHODS**

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

#### **1.3 CHARACTERIZATION OF EXCAVATED MATERIALS**

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

## **1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE**

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

## **1.5 OFF-SITE MATERIALS TRANSPORT**

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are shown in the directions included as Appendix 6. . This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

## **1.6 MATERIALS DISPOSAL OFF-SITE**

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization

sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

## **1.7 MATERIALS REUSE ON-SITE**

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 1. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. At the present time reuse of on-Site materials is not anticipated.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

## **1.8 DEMARCATION**

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three

methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

## **1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES**

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in Table 1.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

## **Source Screening and Testing**

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

### **1.10 FLUIDS MANAGEMENT**

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the

groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

### **1.11 STORM-WATER POLLUTION PREVENTION**

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

### **1.12 CONTINGENCY PLAN**

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER.

Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

### **1.13 ODOR, DUST AND NUISANCE CONTROL**

#### **Odor Control**

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the Remedial Action Report.

#### **Dust Control**

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and

corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

### **Other Nuisances**

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

# **APPENDIX 4**

## **SITE DEVELOPMENT PLANS**



**C1 EAST-WEST BUILDING SECTION AT GARAGE RAMP**  
A-212 1/8" = 1'-0"

# FULTON SOUTH

1320-1328 FULTON STREET  
BROOKLYN, NY 11216

Owner  
FULTON SOUTH DEVELOPMENT LLC  
767 Third Avenue, 33rd Floor  
New York, NY 10017

Architect  
**CURTIS + GINSBERG ARCHITECTS LLP**  
299 Broadway, Suite 1107  
New York, New York 10007

Structural Engineer  
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MEP  
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Civil Engineer / BPP  
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LAND SURVEYING, P.C.  
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Jamaica, NY 11432

Sustainable Design Consultant  
STEVEN WINTER ASSOCIATES INC.  
307 7th Avenue, Suite 1701  
New York, NY 10001

PRELIMINARY DRAWING  
PROGRESS PRINT ONLY  
NOT FOR CONSTRUCTION

No.	Date	Revision

07/19/13	DOB RESUBMISSION
07/12/13	85% CD SUBMISSION
06/22/13	DOB SUBMISSION

No.	Date	Submission

Title:  
**E-W BUILDING SECTION 2**

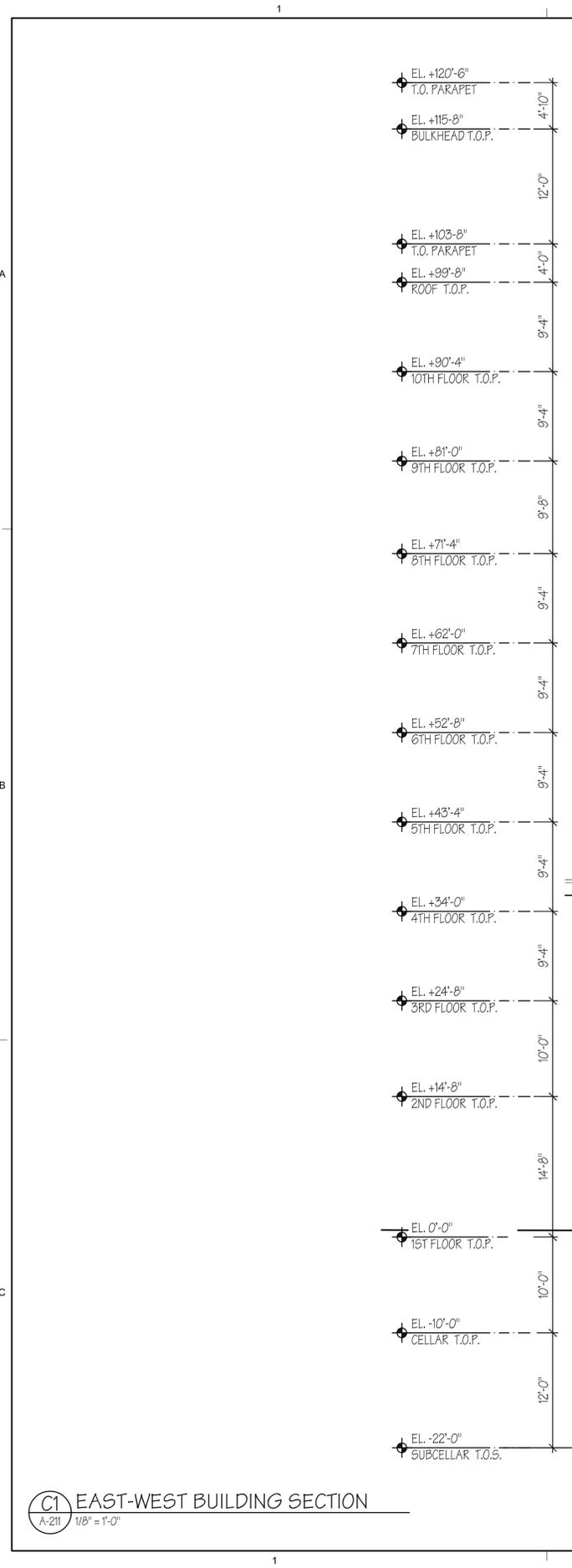
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Checked By: MEG

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55 of 112 **A-212.00**  
G:\DWG\1220 FULTON SOUTH



# FULTON SOUTH

1320-1328 FULTON STREET  
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No.	Date	Revision
07/19/13	07/12/13	05/22/13

No.	Date	Submission
07/19/13	07/12/13	05/22/13

Title:  
**E-W BUILDING SECTION 1**

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08.14.13

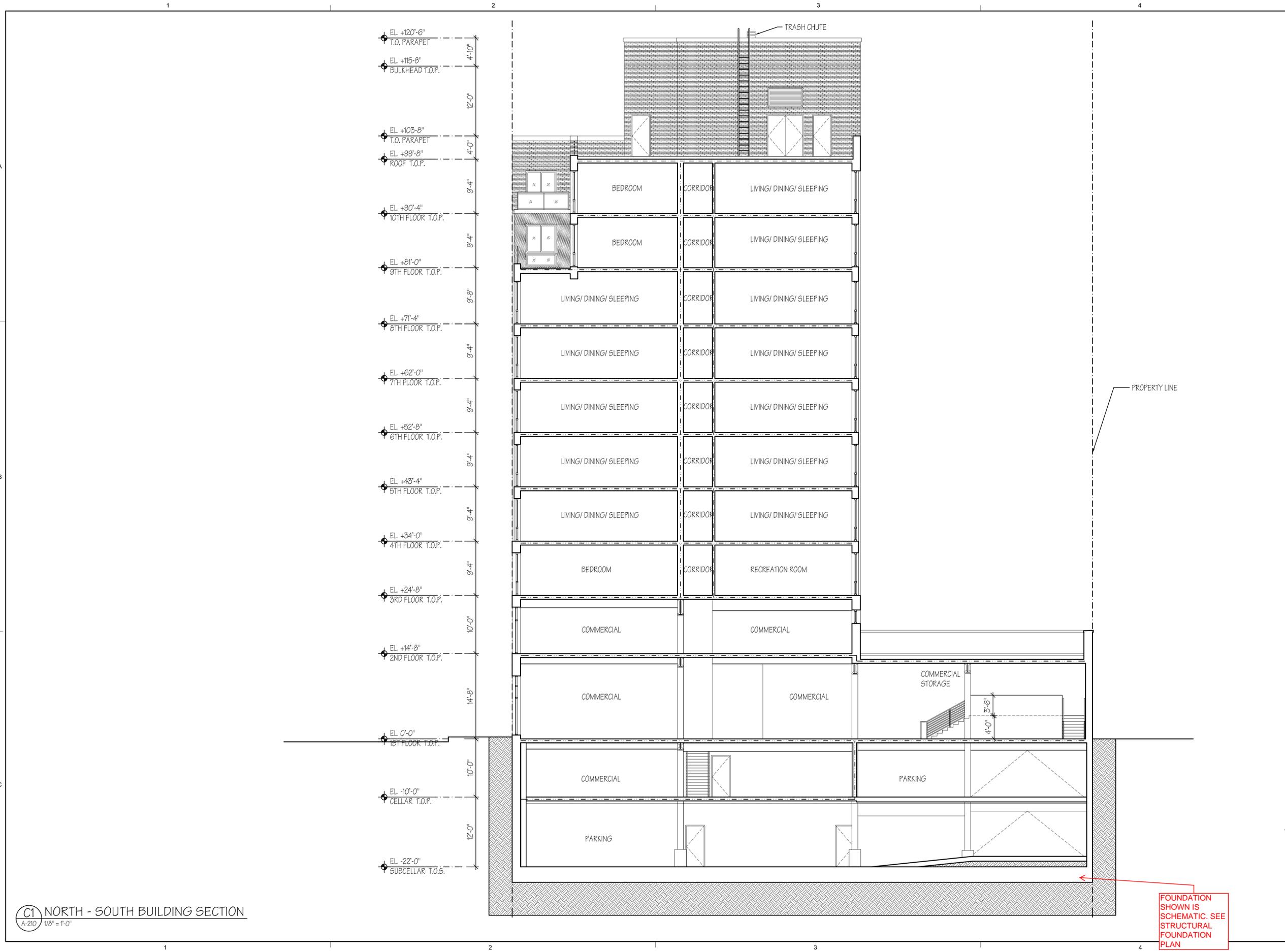
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54 of 112

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G:\DWG\1220 FULTON SOUTH



# FULTON SOUTH

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New York, NY 10001

PRELIMINARY DRAWING  
PROGRESS PRINT ONLY  
NOT FOR CONSTRUCTION

No.	Date	Revision
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07/19/13	DOB RESUBMISSION
07/12/13	85% CD SUBMISSION
05/22/13	DOB SUBMISSION

No.	Date	Submission
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Title:  
**N-S BUILDING SECTION**

DRAFT  
08.14.13

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**A-210.00**

53 of 112

G:\DWG\1220 FULTON SOUTH

**C1** NORTH - SOUTH BUILDING SECTION  
A-210 1/8"=1'-0"

## **APPENDIX 5**

### **VAPOR BARRIER DESIGN SPECIFICATIONS**

According to information provided by the Developer, the entire Site is to be excavated to a depth of 23-feet for sub-cellar storage and automobile parking. A 20-mil vapor barrier will be installed beneath the concrete slab of the sub-cellar, and along the sub-surface walls of both the cellar and sub-cellar. The selected vapor barrier is 20 mil HDPE geomembrane manufactured by GSE Environmental or equivalent. Installation will be performed according to the manufacturer's specifications. Copies of the HPDE geomembrane specifications are attached. As an additional preventative measure a passive sub-slab depressurization system (SSDS) will be installed beneath the vapor barrier within the sub-base material of the new building.

#### **References and Standards for the Vapor Barrier**

American Society for Testing and Materials (ASTM):

1. ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
2. ASTM E 1643-10 Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

American Concrete Institute (ACI):

1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

#### **Materials**

The following vapor barrier materials are provided by GSE Environmental, LLC (800) 435-2008 [www.gseworld.com](http://www.gseworld.com).

1. GSE HD 20 mil Nominal smooth HDPE geomembrane
2. Butyl mastic self-adhesive tape
3. Liquid membrane
4. Stainless Steel Batten

5. GSE Poly Lock
6. GSE HDPE Pipe Boot

## **Installation**

1. The GSE 20-mil HDPA membrane can be installed directly over an aggregate, sand or tamped earth base. The base material should be level and compact per the geotechnical engineering specifications.
2. Install vapor barrier in accordance with manufacturer's instructions and ASTM E 1643.
3. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement. The vapor barrier should completely cover the concrete placement area.
4. All joints/seams should be overlapped and sealed with either a tape seal or weld seal. The area of adhesion should be free of dust, dirt and moisture to ensure maximum adhesion of tape. The tape seal is a butyl mastic self-adhesive tape, 2-inches wide, compatible with the membrane. The weld seal consists of an extruded rod or bead, compatible with the membrane.
5. The vapor barrier shall be continuous to prevent vapor intrusion. The vapor barrier shall be placed completely beneath the concrete floor area and exterior sub-grade walls up to street level.
6. Seal around all penetrations such as utility conduits and drainage pipes per manufacturer's instructions.
7. Care should be undertaken to prevent damage to the vapor barrier during construction, including installation of reinforcing steel, utilities and concrete.
8. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 12 inches and taping all sides with tape per manufacturer's instructions.

**Inspection**

Subsequent to installation, prior to concrete placement, the contractor shall coordinate an inspection with the Engineer or its designated representative. The membrane shall not be covered until the contractor has received approval from the Engineer.



The Power of Geosynthetics

## GSE HD 20 mil Nominal Smooth Geomembrane

GSE HD 20 mil Nominal is a smooth high density polyethylene (HDPE) geomembrane manufactured with the highest quality resin specifically formulated for flexible geomembranes. This product is used in applications that require excellent chemical resistance and endurance properties.

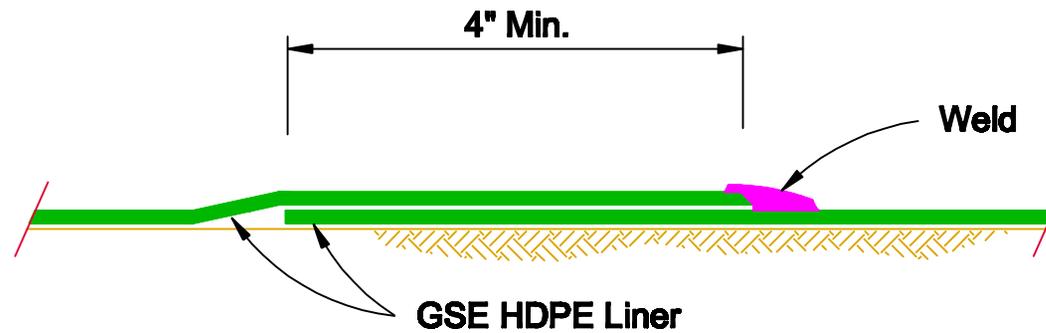
### Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE
Thickness, (minimum average) mil (mm) with a tolerance +/- 10%	ASTM D 5199	every roll	20 (0.5)
Density, g/cm <sup>3</sup>	ASTM D 1505	200,000 lb	0.94
Tensile Properties (each direction)	ASTM D 6693, Type IV Dumbell, 2 ipm	20,000 lb	76 (12)
Strength at Break, lb/in-width (N/mm)			42 (7)
Strength at Yield, lb/in-width (N/mm)			500
Elongation at Break, %	G.L. 2.0 in (51 mm)		12
Elongation at Yield, %	G.L. 1.3 in (33 mm)		
Tear Resistance, lb (N)	ASTM D 1004	45,000 lb	13 (57)
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	36 (158)
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note <sup>(1)</sup>
Notched Constant Tensile Load <sup>(2)</sup> , hr	ASTM D 5397, Appendix	200,000 lb	1,000
Oxidative Induction Time, min	ASTM D 3895, 200° C; O <sub>2</sub> , 1 atm	200,000 lb	>140
TYPICAL ROLL DIMENSIONS			
Roll Length <sup>(3)</sup> , ft (m)			1,670 (509)
Roll Width <sup>(3)</sup> , ft (m)			22.5 (6.8)
Roll Area, ft <sup>2</sup> (m <sup>2</sup> )			37,575 (3,490)

**NOTES:**

- <sup>(1)</sup>Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- <sup>(2)</sup>Roll lengths and widths have a tolerance of ± 1%.
- GSE HD is available in rolls weighing approximately 3,900 lb (1,769 kg).
- All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
- \*Modified.

OTDSDH R01/13/10



## Typical Fillet Extrusion Weld

Not to scale



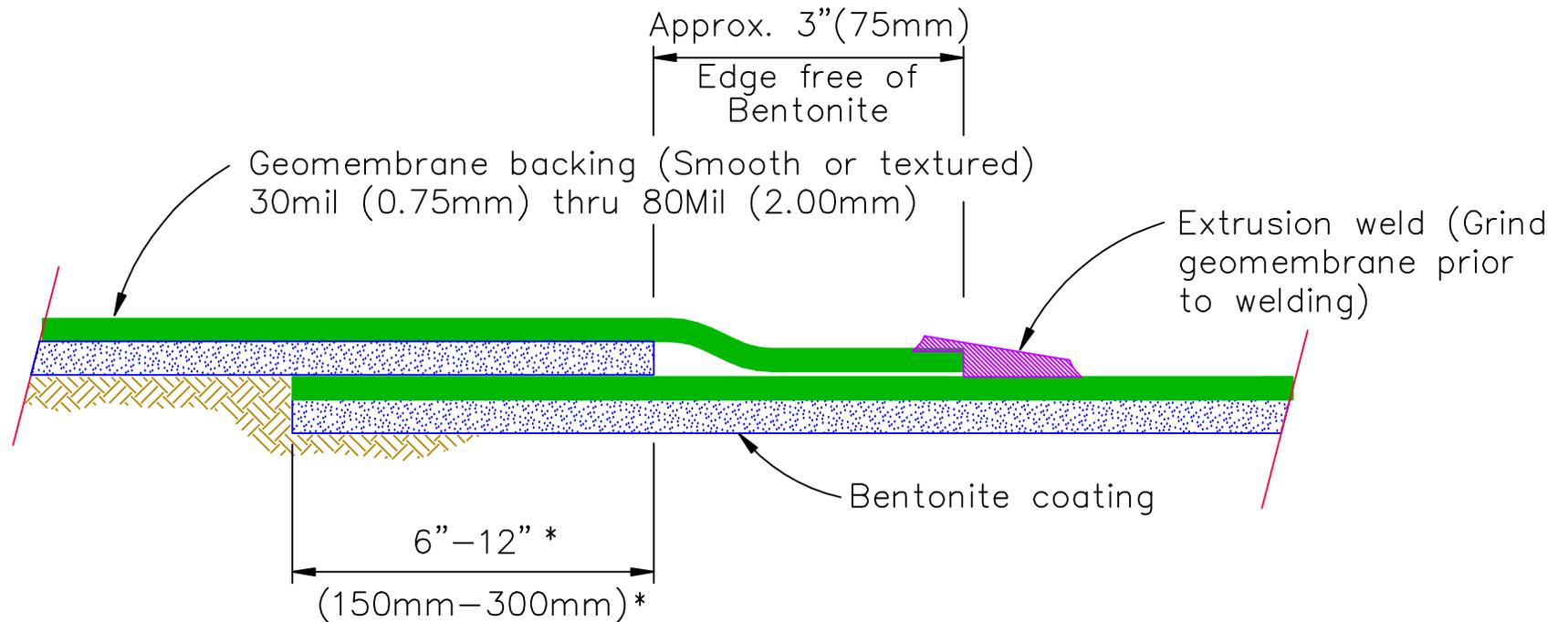
GSE Environmental, LLC  
 19103 Gundle Road  
 Houston, Texas 77073-3598  
 800-435-2008 / 281-443-8564

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DRAWN MG DATE 01/10/2010

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REVISION 0 DWG. NO. GSE-013

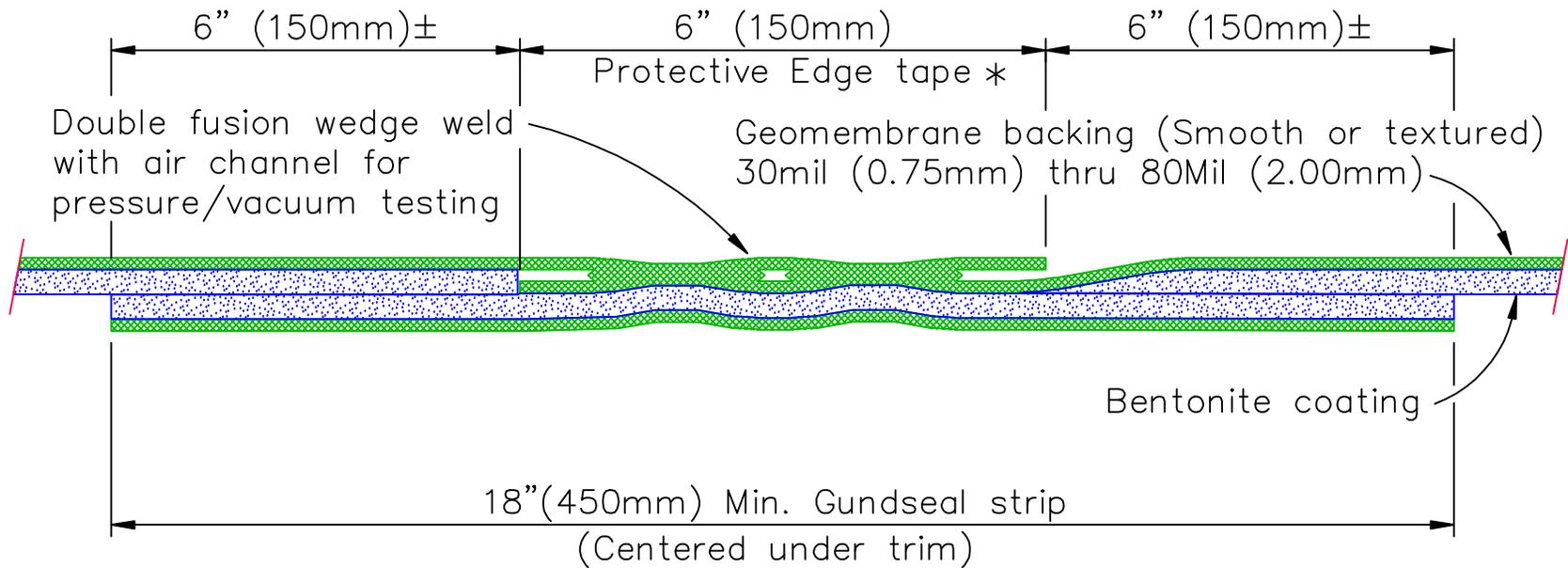


\* Overlap length dependant on subgrade condition and anticipated settlement

## Gundseal Extrusion Welded Seam

Not to scale

\*Remove edge tape  
prior to welding



## Gundseal Wedge Weld Seam (Geomembrane side up) Not to scale



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MG

DATE

01/10/2010

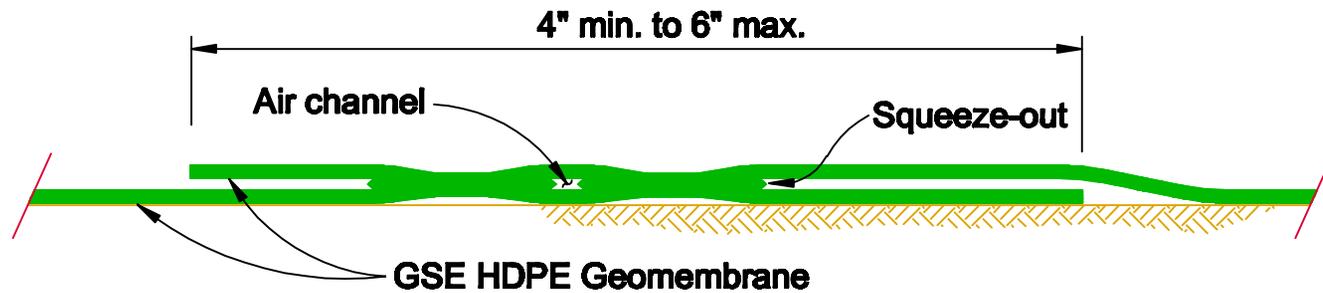
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## Typical Hot Wedge Double Track Fusion Weld

Not to scale



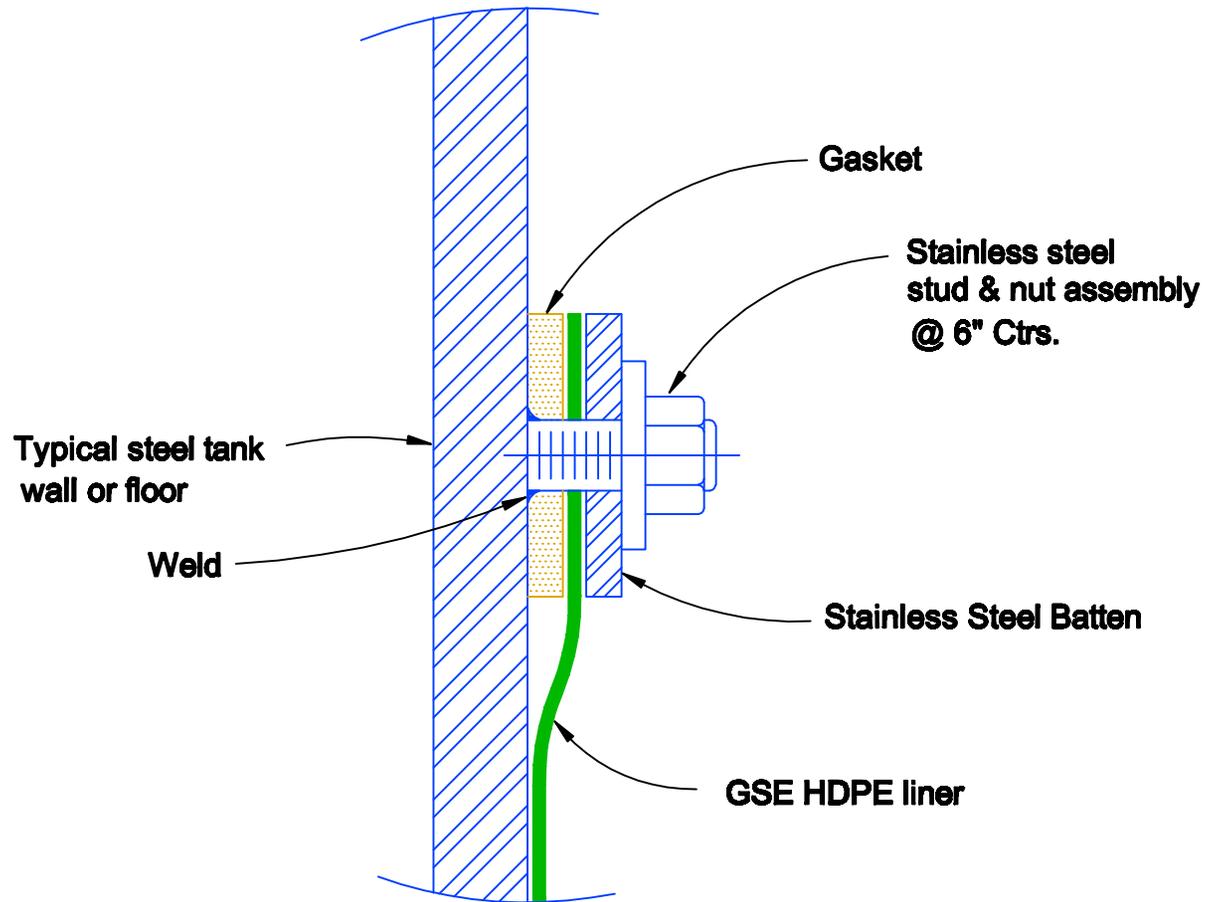
GSE Environmental, LLC  
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 800-435-2008 / 281-443-8564

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## Welded Stud Attachment

Not to scale



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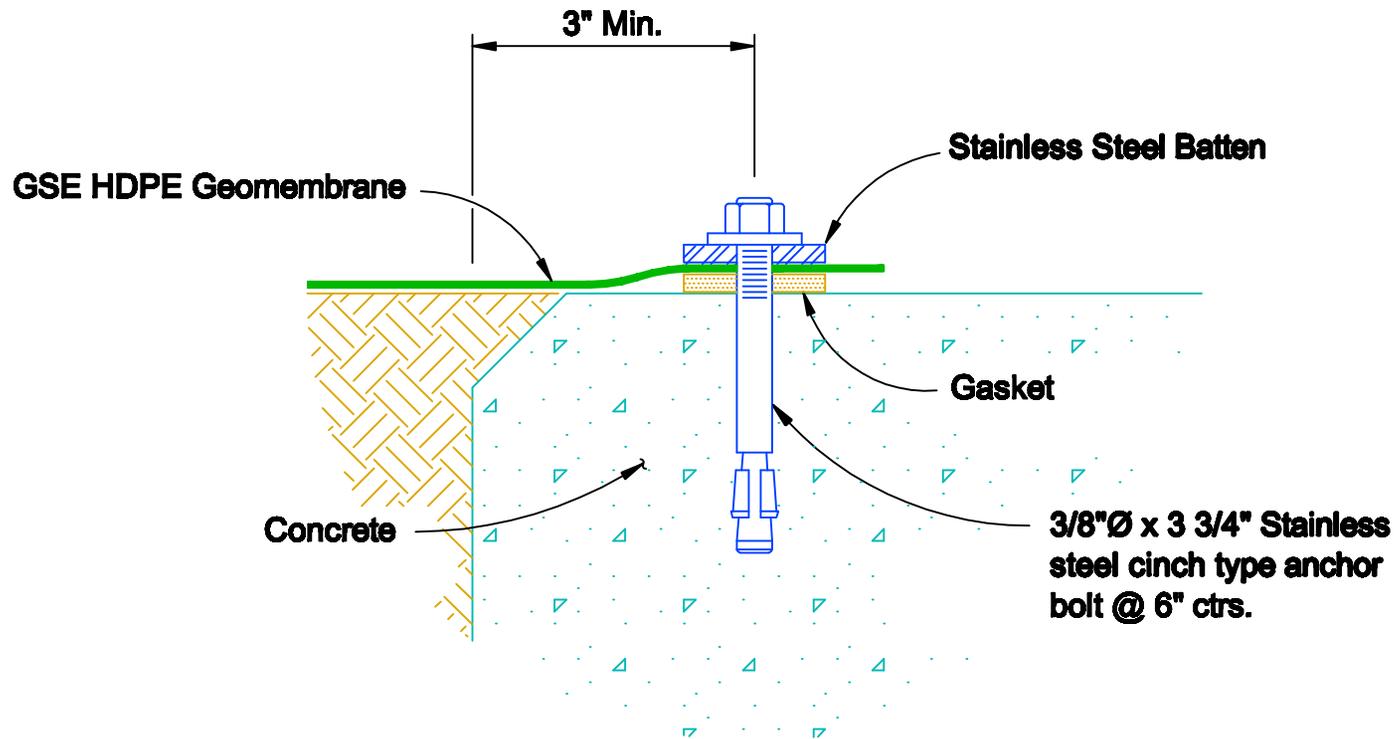
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REVISION 0

DWG. NO. GSE028



**Steel Batten w/Concrete Anchor**

Not to scale



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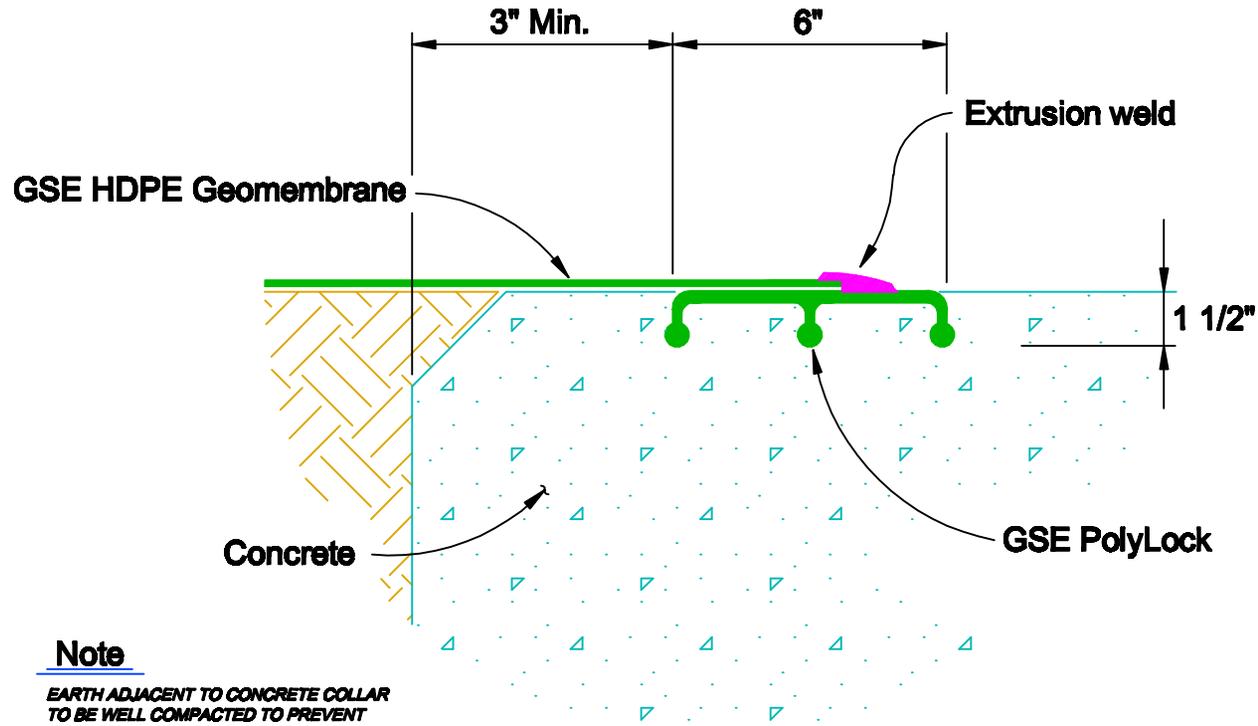
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DATE 03/25/05

REVISION 0

DWG. NO. GSE024



**Note**

*EARTH ADJACENT TO CONCRETE COLLAR TO BE WELL COMPACTED TO PREVENT FUTURE DIFFERENTIAL SETTLEMENT.  
ALL CONCRETE COLLARS TO BE CHAMFERED A MINIMUM OF 1" (TYP.) @ ALL CORNERS IN CONTACT WITH LINER.*

**PolyLock Attachment**

Not to scale



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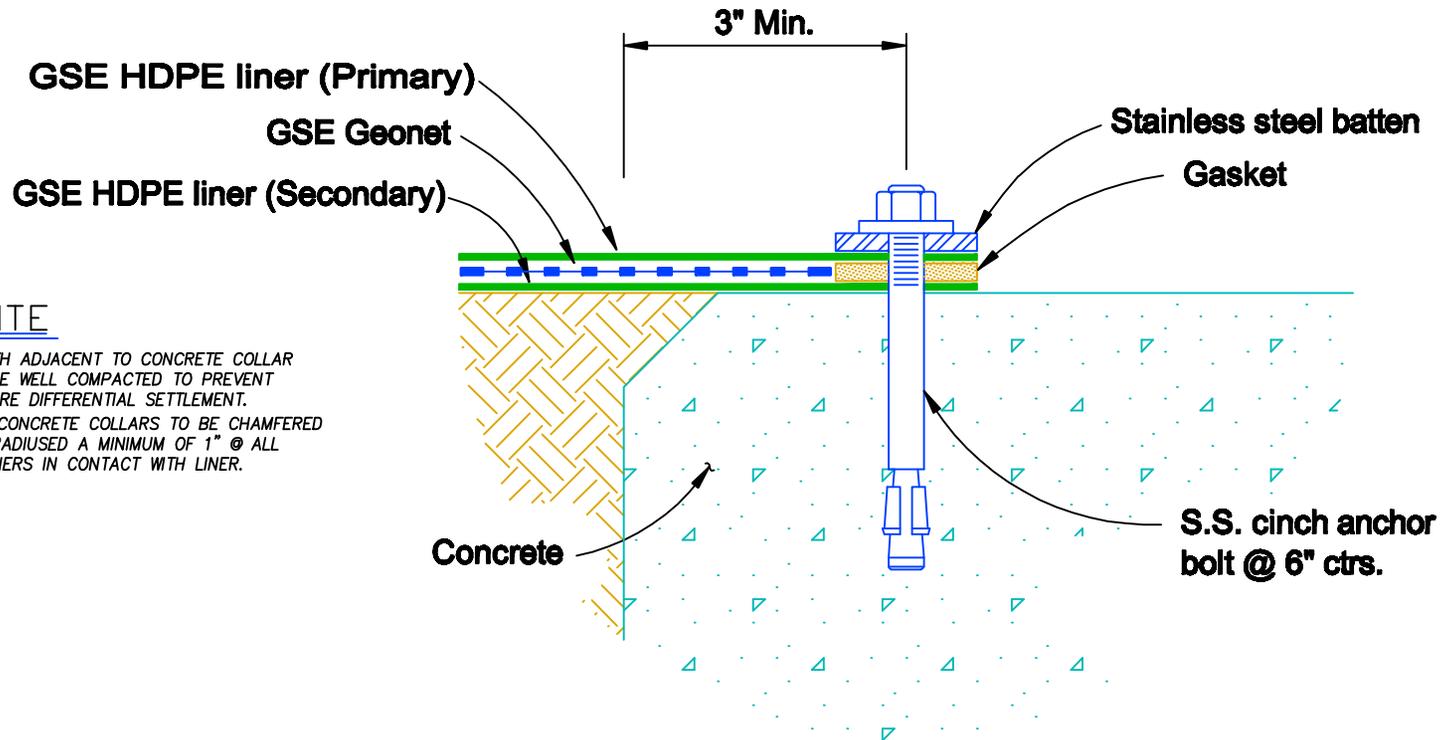
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DATE 03/25/05

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DWG. NO. GSE025



**NOTE**

EARTH ADJACENT TO CONCRETE COLLAR TO BE WELL COMPACTED TO PREVENT FUTURE DIFFERENTIAL SETTLEMENT.  
 ALL CONCRETE COLLARS TO BE CHAMFERED OR RADIUSED A MINIMUM OF 1" @ ALL CORNERS IN CONTACT WITH LINER.

**Concrete Anchor w/Double Liner**

Not to scale



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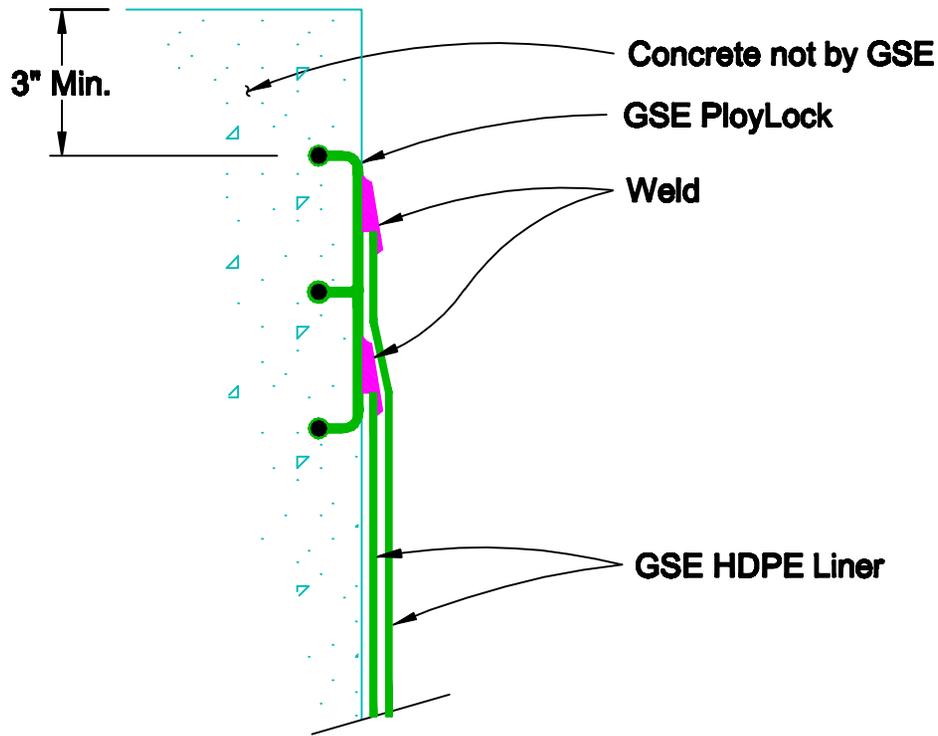
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## Polylock Attachment Detail

Not to scale



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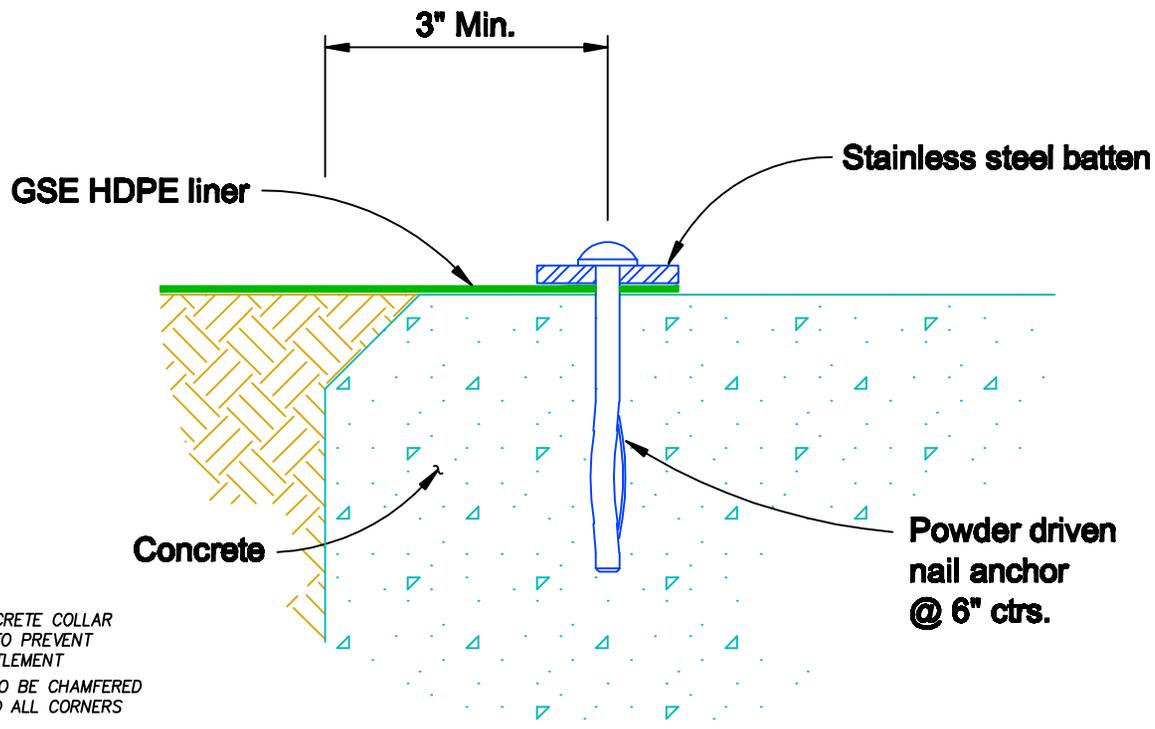
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DWG. NO. GSE027



**NOTE**

EARTH ADJACENT TO CONCRETE COLLAR TO BE WELL COMPACTED TO PREVENT FUTURE DIFFERENTIAL SETTLEMENT  
 ALL CONCRETE COLLARS TO BE CHAMFERED A MINIMUM OF 1" (TYP.) @ ALL CORNERS IN CONTACT WITH LINER  
 THIS DETAIL SHOULD BE USED ONLY ABOVE MAX. FLUID LEVELS.

**Powder Driven Nail Anchor Detail**

Not to scale



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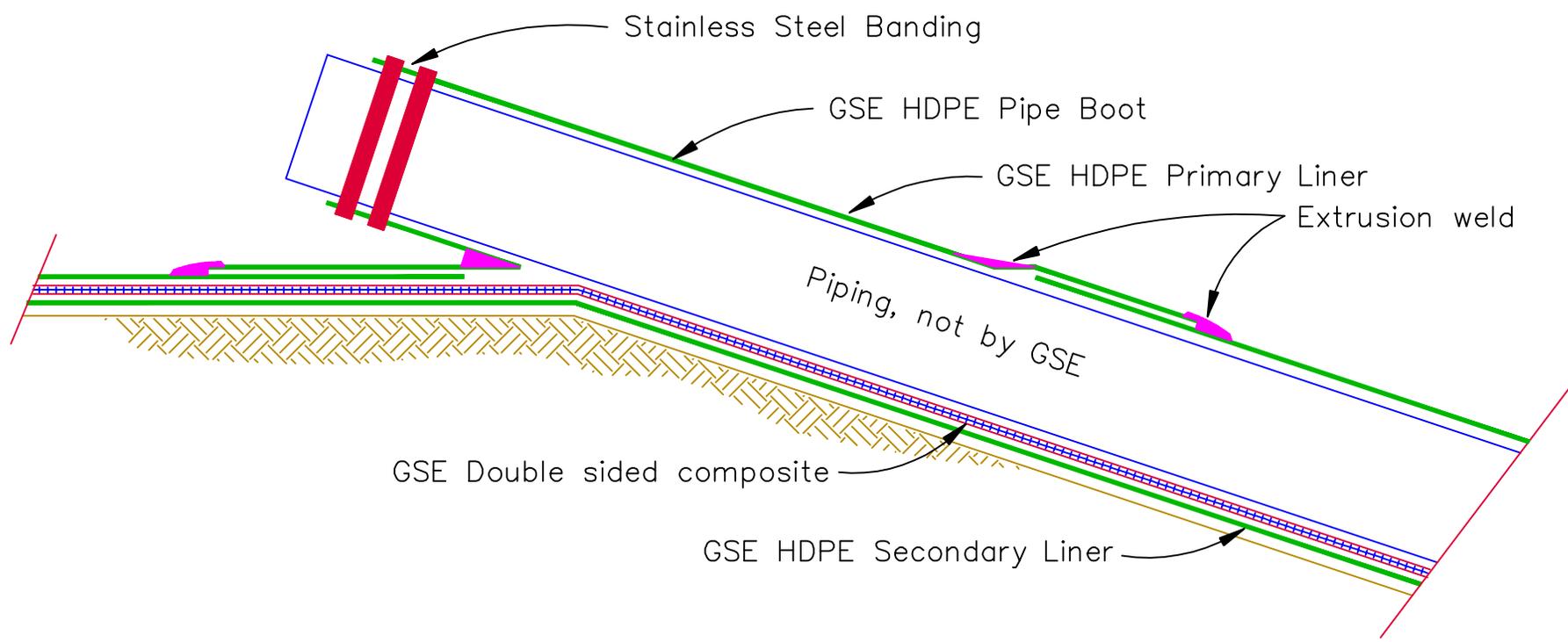
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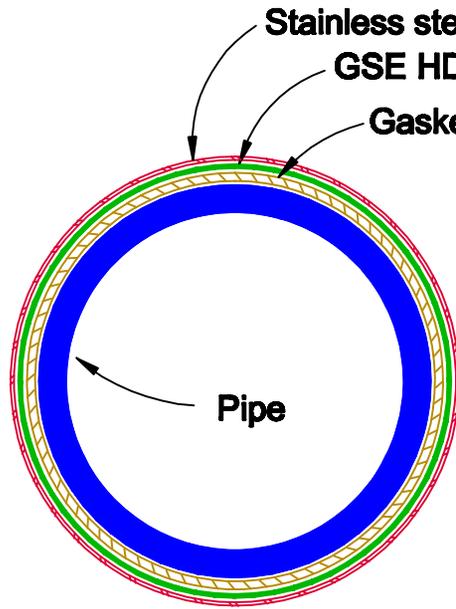
DATE 03/25/05

REVISION 0

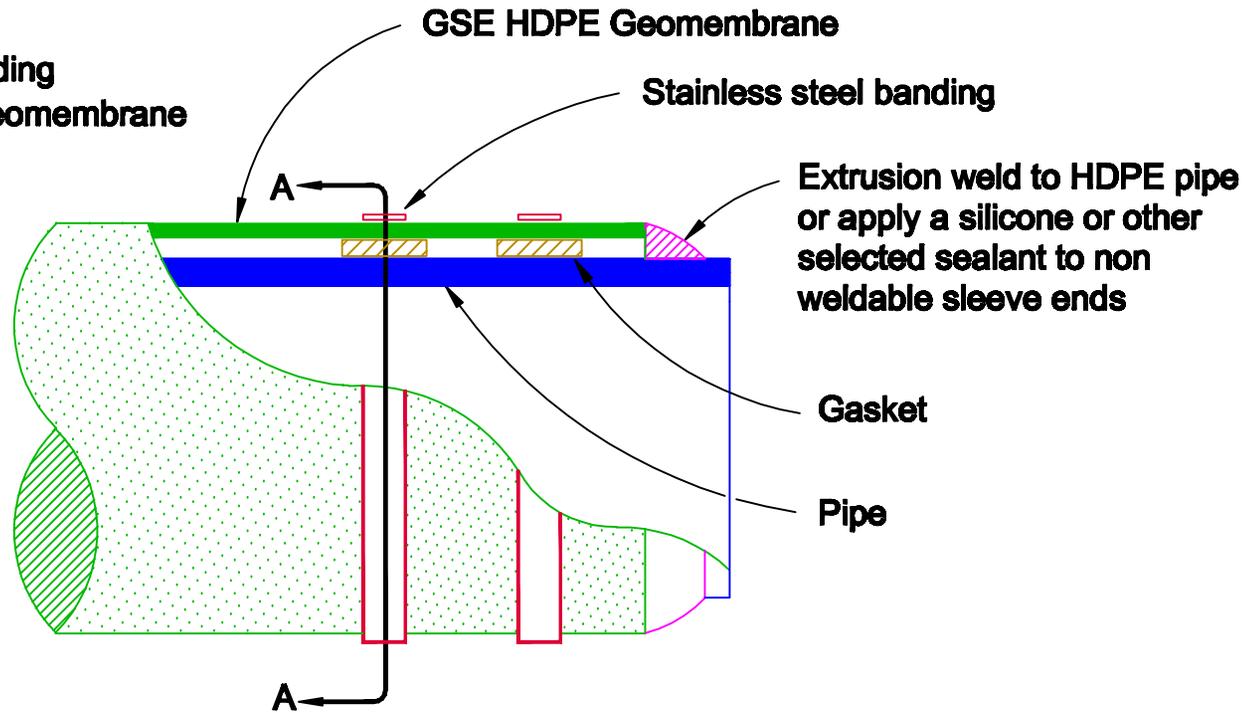
DWG. NO. GSE029



Double Lined Penetration on Slope  
Not to scale

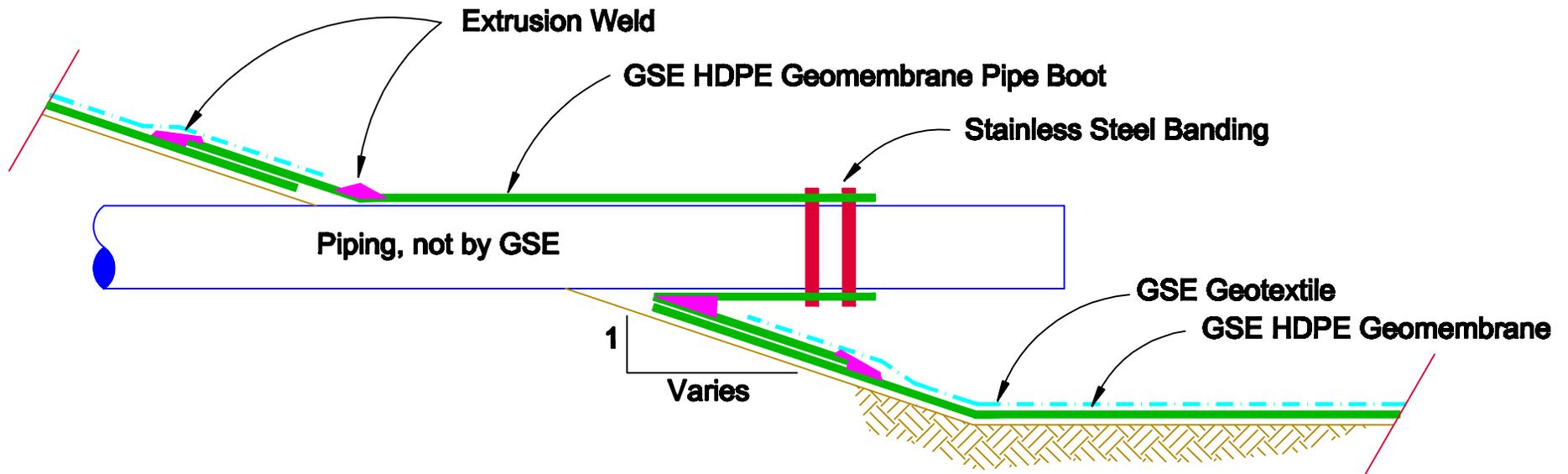


**Section A-A**

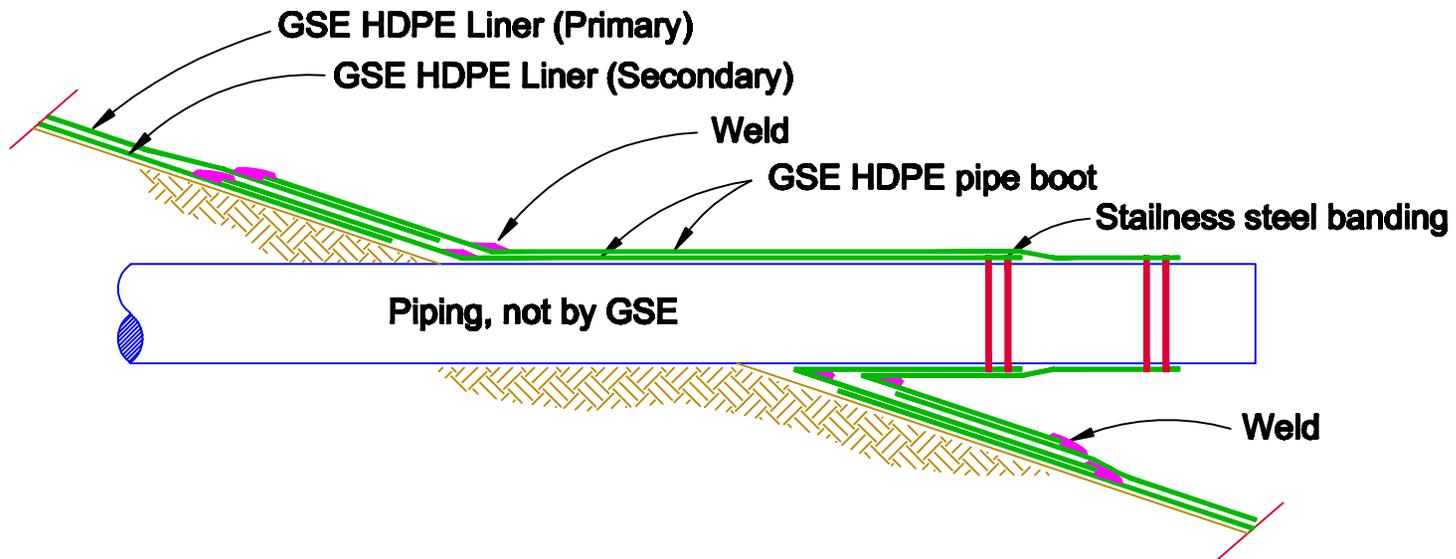


**Pipe Penetration Seal**

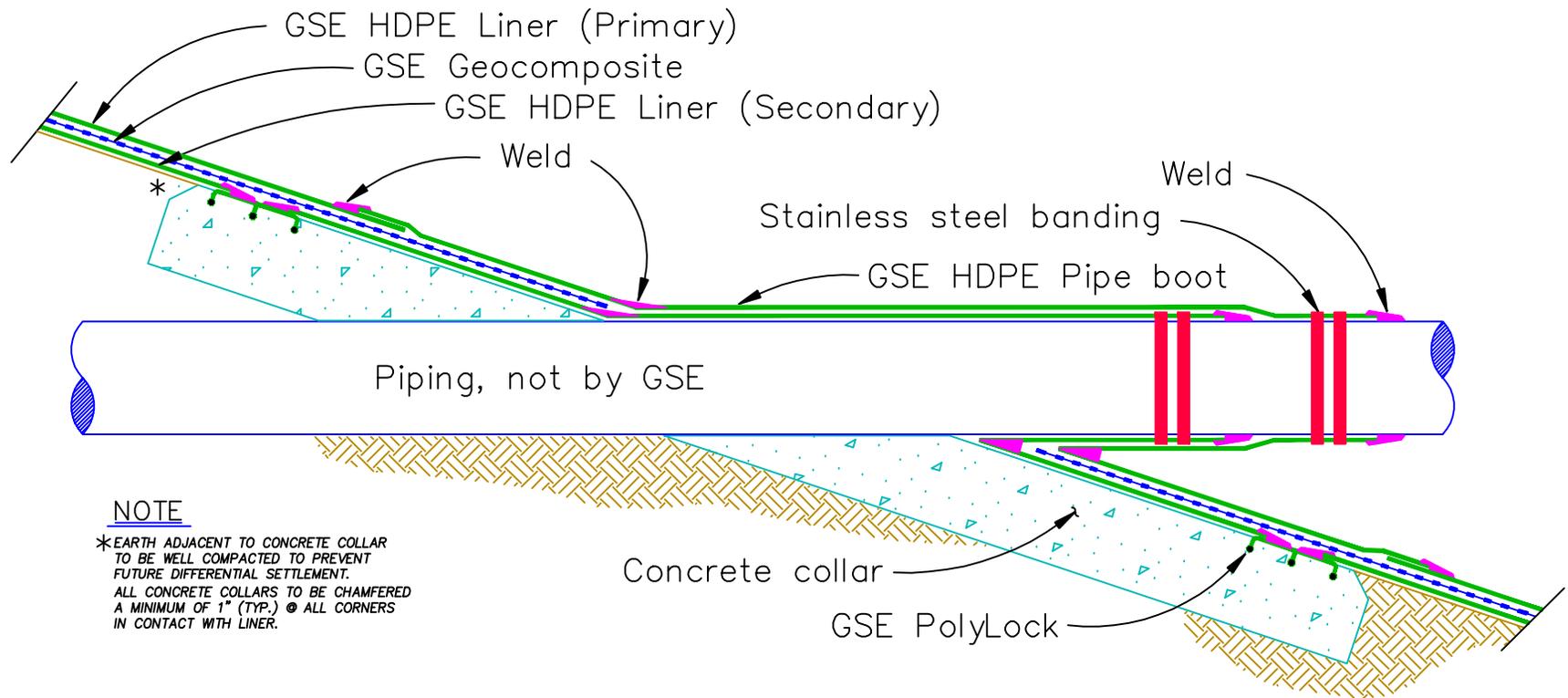
(Vertical or horizontal)  
Not to scale



**Typical Pipe Penetration**  
 (Single Liner w/Cushion Geotextile)  
 Not to scale

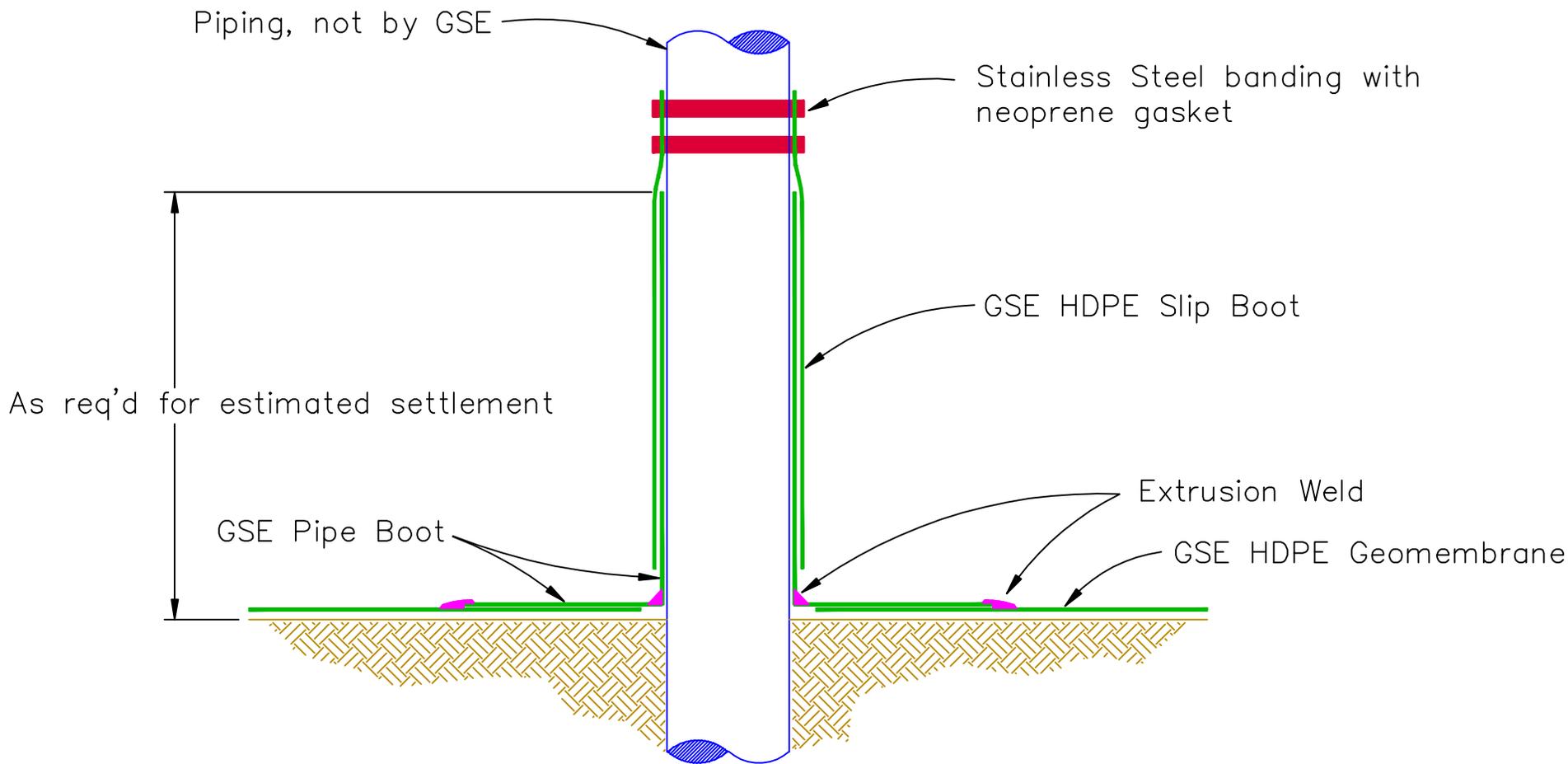


**Typical Double Booted Pipe Penetration**  
Not to Scale



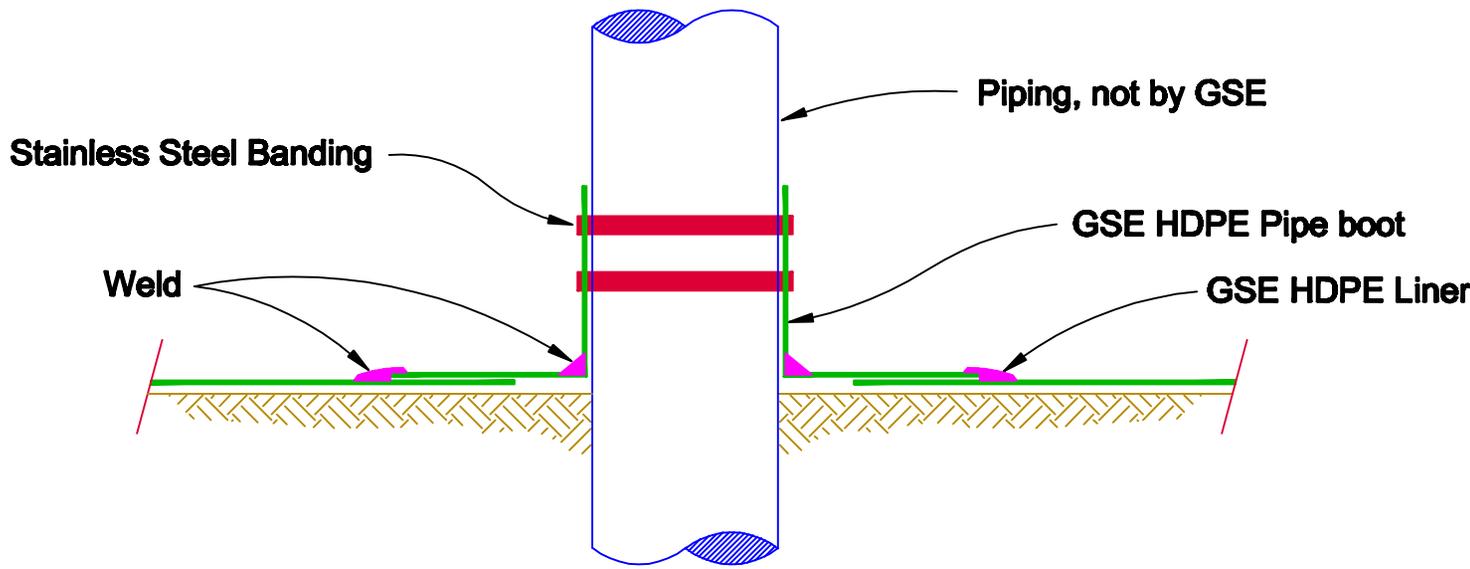
## Typical Double Booted Pipe Penetration at Concrete Collar w/Polylock Attachment

Not to scale



## Typical Penetration w/HDPE Slip Boot

Not to scale



**Typical Vertical Pipe Penetration**  
**Not to Scale**

## **APPENDIX 6**

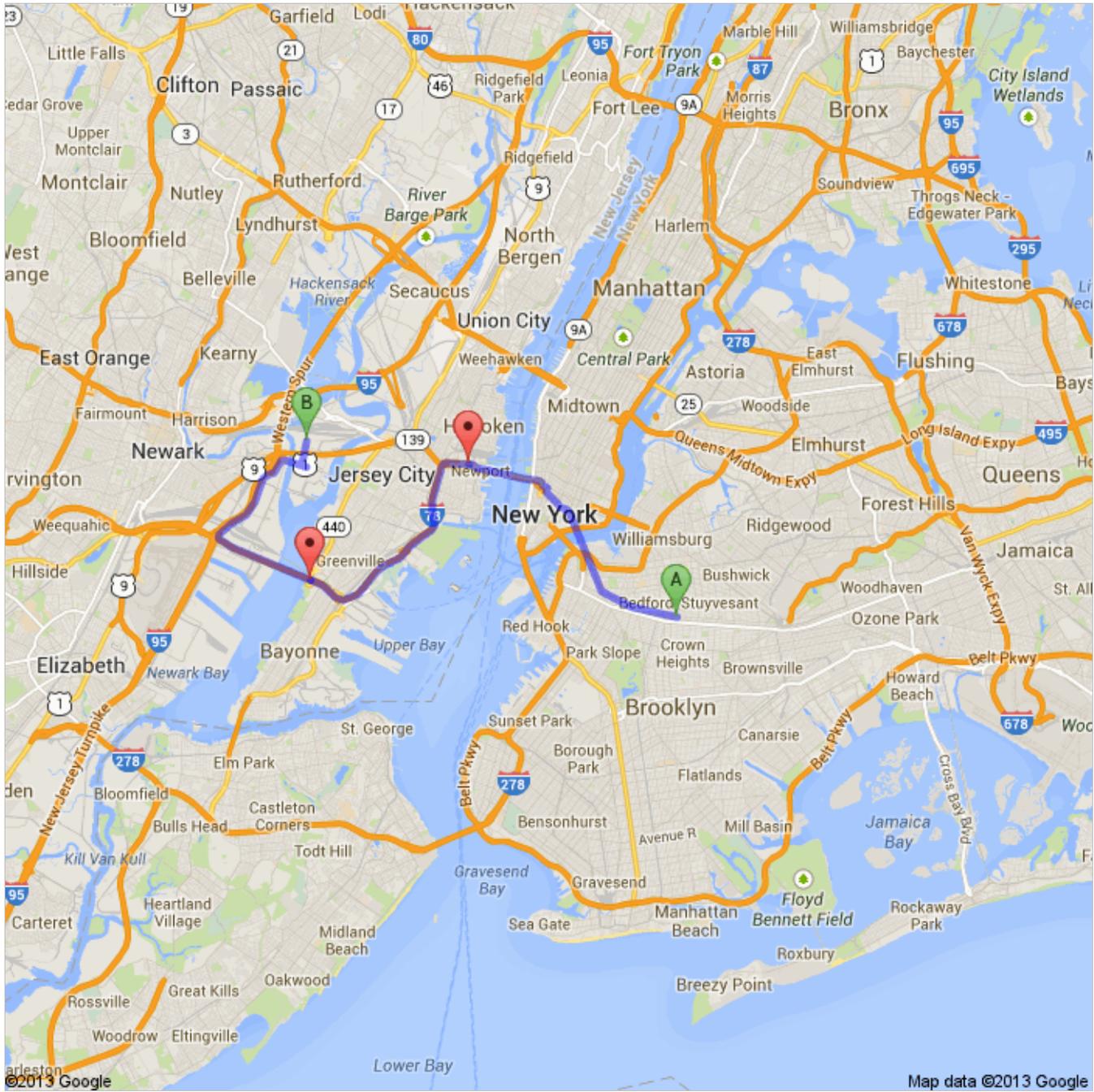
### **OUTBOUND TRUCK TRANSPORT ROUTE**



### Directions to Clean Earth of New Jersey Inc

115 Jacobus Ave, Kearny, NJ 07032

18.6 mi – about 36 mins



 1328 Fulton St, Brooklyn, NY 11216

- |   |   |                            |
|---|---|----------------------------|
|   | 1. Head <b>west</b> on <b>Fulton St</b> toward <b>Verona Pl</b><br>About 7 mins   | go 1.9 mi<br>total 1.9 mi  |
|    | 2. Slight right onto <b>Flatbush Avenue Extension</b><br>About 3 mins   | go 0.6 mi<br>total 2.5 mi  |
|    | 3. Slight right to stay on <b>Flatbush Avenue Extension</b>   | go 0.1 mi<br>total 2.6 mi  |
|   | 4. Continue onto <b>Manhattan Bridge/Manhattan Bridge Upper Roadway</b><br>About 2 mins   | go 1.3 mi<br>total 3.9 mi  |
|    | 5. Turn left onto <b>Canal St</b><br>About 4 mins   | go 0.7 mi<br>total 4.6 mi  |
|    | 6. Slight right onto <b>6th Ave</b>   | go 0.1 mi<br>total 4.7 mi  |
|    | 7. Turn left onto <b>Watts St</b><br>About 1 min  | go 0.1 mi<br>total 4.8 mi  |
|    | 8. Continue onto <b>I-78 W/Holland Tunnel</b><br>Continue to follow I-78 W<br>Entering New Jersey<br>About 5 mins   | go 2.2 mi<br>total 7.0 mi  |
|    | 9. Keep right to stay on <b>I-78 W</b> , follow signs for <b>Turnpike/Interstate 78/Interstate 95</b><br><b>Toll road</b><br>About 8 mins                   | go 7.4 mi<br>total 14.5 mi |
|  | 10. Take exit <b>14</b> for <b>Interstate 95 N/Turnpike N</b> toward <b>US 1/US 9/US 22/New'k Airport</b><br><b>Toll road</b>                               | go 0.2 mi<br>total 14.7 mi |
|  | 11. Keep left at the fork, follow signs for <b>I-95 N/Turnpike N</b><br><b>Toll road</b><br>About 1 min   | go 1.2 mi<br>total 15.9 mi |
|  | 12. Take exit <b>15E-15X-16E-18E</b> on the left for <b>Interstate 95</b> toward <b>US 46/Interstate 80/New Jersey 3/Lincoln Tunnel</b><br><b>Toll road</b> | go 0.5 mi<br>total 16.4 mi |
|  | 13. Merge onto <b>I-95 N</b><br><b>Toll road</b>  | go 0.4 mi<br>total 16.8 mi |
|  | 14. Take exit <b>15E</b> toward <b>Jersey City</b><br><b>Partial toll road</b><br>About 1 min   | go 0.7 mi<br>total 17.5 mi |
|  | 15. Merge onto <b>U.S. 1 Truck N/US-9 Truck N/Lincoln Hwy/Raymond Blvd</b><br>Continue to follow U.S. 1 Truck N/US-9 Truck N/Lincoln Hwy                    | go 0.4 mi<br>total 17.9 mi |
|  | 16. Take the <b>Jacobus Ave</b> exit  | go 0.2 mi<br>total 18.1 mi |
|   | 17. Continue straight onto <b>Jacobus Ave</b><br>Destination will be on the left<br>About 1 min   | go 0.5 mi<br>total 18.6 mi |

 **Clean Earth of New Jersey Inc**  
115 Jacobus Ave, Kearny, NJ 07032

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2013 Google

Directions weren't right? Please find your route on [maps.google.com](https://maps.google.com) and click "Report a problem" at the bottom left.

# **APPENDIX 7**

## **HEALTH AND SAFETY PLAN**



**Shaping the Future**

# **CONSTRUCTION HEALTH AND SAFETY PLAN**

**Fulton South  
1328 Fulton Street  
Block 1861, Lot 119  
Brooklyn, NY 11216  
OER Project Number: 13EH-A393K  
CEQR Number: 07DCP070K**

**Prepared By:  
Cardno ATC  
104 East 25<sup>th</sup> Street, 10<sup>th</sup> Floor  
New York, New York 10010**



**Fulton South Development LLC  
767 3rd Avenue, 33rd Floor  
New York, New York 10017  
mserafy@brpcompanies.com**



**CARDNO ATC  
CONSTRUCTION HEALTH AND SAFETY PLAN (CHASP)  
REVIEW AND APPROVAL**

**CLIENT:** Fulton South Development LLC

**PROJECT NUMBER:** 015.38242.0025

**SITE NAME/LOCATION:** Fulton South  
1328 Fulton Street  
Brooklyn, NY 11216

**PROJECT DESCRIPTION:** Excavation and Pre-construction Activities for the Proposed Development of the Property

**PREPARED BY:** John Mascioli  
**TITLE:** Project Manager

_____ Project Manager	_____ Signature	_____ Date
John Mascioli		September 11, 2013
_____ Reviewer's Name	_____ Signature	_____ Date
Michael G. Donovan, CIH		September 11, 2013

This Health and Safety Plan (Plan) has been written for the use of Cardno ATC (ATC) and its employees. It may also be used as a guidance document by properly trained and experienced ATC subcontractors. However, ATC does not guarantee the health or safety of any person entering this Site.

Due to the potential hazardous nature of this Site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this Site. The health and safety guidelines in this Plan were prepared specifically for this Site and should not be used on any other Site without prior research by trained health and safety specialists.

ATC claims no responsibility for use of this Plan by others. The Plan is written for the specific Site conditions, purposes, dates, and personnel specified and must be amended if these conditions change.

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## EMERGENCY INFORMATION

### Site Emergencies Call:

**Ambulance**                    **911**

**Fire:**                            **911**

**Police:**                        **911**

**Nationwide Call Before You Dig**        **811**

**COMP-CARE (24 hour First-Aid)**        **(800) 756-1130**

**Poison Control Center:**                **(800) 222-1222**

**National Response Center:**            **(800) 424-8802**

**Spills:**                        **NYSDEC**                            **800-457-7362**  
                                      **State Health Department**  
                                      **Environmental Health**            **800-458-1158**

**Hospital**                        (718) 613-4000  
                                      **Interfaith Medical Center**  
                                      1545 Atlantic Avenue, Brooklyn, NY 11213

- 1). Head east on Fulton Street toward New York Avenue – go 0.8 mile
  - 2). Turn right onto Schenectady Avenue – go 0.1 mile
  - 3). Turn right on Atlantic Avenue – go 0.2 mile
- Arrive at 1545 Atlantic Avenue, Brooklyn, NY 11213, Interfaith Medical Center – on right.

Approximate distance: 1.1 mile  
Approximate travel time: 5 minutes

**EMERGENCY ASSEMBLY LOCATION:** At The Bradford, The southeast corner of Fulton Street and Albany Avenue.

### FIRST-AID MEASURES

The following contaminants may be present in the soil and/or groundwater at the site: Petroleum and non-petroleum related VOCs, SVOCs; metals; PCBs; and pesticides.

The following procedures will be used:

Eye Contact: Flush eye immediately with copious amount of water for a minimum of 15 minutes. Repeat until irritation is eliminated and seek medical attention.

Skin Contact: Wash exposed area with soap and water for at least 15 minutes. If dermatitis or severe reddening occurs, seek medical attention.

Inhalation: Move the person into fresh air. If symptoms persist, seek medical attention.

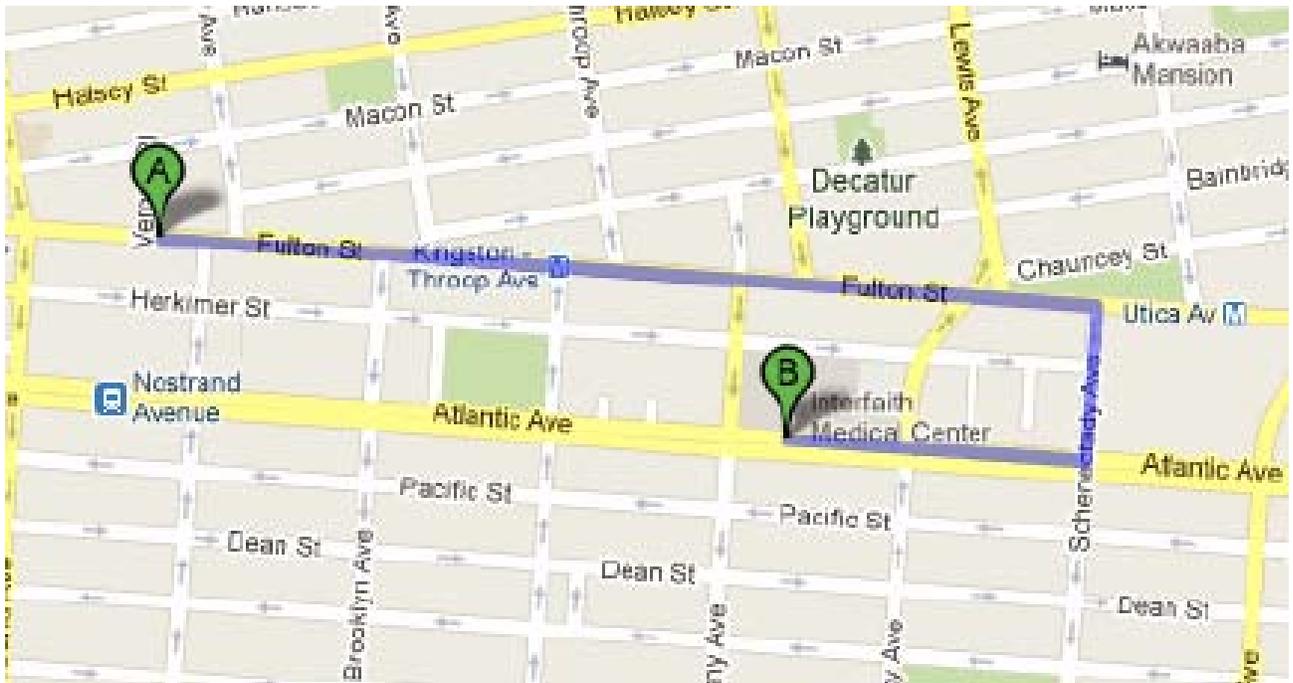
Ingestion: Do not induce vomiting. Seek immediate medical attention.

**Important Numbers:**

Client Contact: .....	<u>Mary Serafy</u>	<u>212 488-1752</u>
State Utility Locate Service: .....	<u>Dig Safely New York</u>	<u>800-962-7962</u>
Site Utility Repair Contractor: .....	<u>Consolidated Edison</u>	<u>800-752-6633</u>
ATC Lifelines: .....	<u>CompCare</u>	<u>800-756-1133</u>

**NOTE: For additional emergencies/important contacts, refer to the ATC Lifelines Card.**

## EMERGENCY MEDICAL ROUTE TO HOSPITAL



**A** 1320 Fulton St, Brooklyn, NY 11216

- |    |  |                           |
|----|--|---------------------------|
| 1. | Head east on <b>Fulton St</b> toward <b>New York Ave</b><br>About 3 mins               | go 0.8 mi<br>total 0.8 mi |
| 2. | Turn right onto <b>Schenectady Ave</b>   | go 0.1 mi<br>total 0.9 mi |
| 3. | Turn right onto <b>Atlantic Ave</b><br>Destination will be on the right<br>About 1 min | go 0.2 mi<br>total 1.1 mi |

**B** **Interfaith Medical Center**  
1545 Atlantic Ave, Brooklyn, NY 11213

## **1.0 - INTRODUCTION**

### **1.1 Scope and Applicability of the Site Health and Safety Plan**

This Construction Health and Safety Plan (CHASP) has been prepared by Cardno ATC (ATC) for the activities associated with the excavation and on-site handling of the material to be removed as part of the proposed construction at 1328 Fulton Street, Brooklyn, New York 11216 (hereinafter referred to as the “Site”).

The health and safety protocols established in this Plan are based on the ATC Employee Health and Safety Policy Manual, the Occupational Safety and Health Administration (OSHA) Regulations, past field experiences, specific Site conditions, and chemical hazards known or anticipated to be present from available Site data. The following Site Construction Health and Safety Plan (CHASP) are intended solely for use during the proposed activities described in the project documents and technical specifications. Specifications here in are subject to review and revision based on actual conditions encountered in the field during Site characterization activities. Such changes may be instituted by using the CHASP List of Approved Amendments and/or Changes (see Appendix C).

Before Site operations begin, all employees, including subcontractors for ATC covered by this plan, involved in these operations will have read and understood this CHASP and all revisions. All Site personnel have the authority to “Stop Work” if unsafe conditions are present or discovered during Site activities. Before work begins, all affected workers will sign the Construction Health and Safety Plan Acknowledgment Form (see Appendix C). By signing this form, all individuals recognize the requirements of the CHASP, known or suspected hazards, and will adhere to the protocols required for the project Site.

### **1.2 Historical Overview**

The Site is located in the Bedford Stuyvesant section of Brooklyn, New York and is identified as Block number 1861 and Lot number 119 on the New York City Tax Map. Figure 2 is a Site location map. The Site is 11,521-square feet and is bounded by Fulton Street to the north, three- and four-story residences and a church to the south, seven-story apartment building to the east, and three-story residential building with retail storefront to the west. Currently, the Site is used as a concrete-paved parking lot and contains no buildings or other Site improvements.

The proposed use of the Site will consist of a new 10-story concrete and brick facade mixed-use rental building located on Fulton Street, in the Bedford Stuyvesant section of Brooklyn, NY. This new development will replace the existing vacant lot, being used as a parking lot, with approximately 14,000 square feet of retail and community facility space and fifty-seven (57) studio, one, two, and three bedroom rental units. The proposed cellar, sub-cellar and 1st floor will encompass the entire lot, 115.21’ wide by 100’ deep, with the sub-cellar being approximately 23’ below grade which is above the groundwater table (groundwater table estimated between 50 to 55 feet below grade). The current zoning designation is C4-5D which is a commercial district that permits residential, commercial, and community facility buildings

The following work has been performed at the site:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed nine (9) soil borings across the entire project Site, and collected 16 soil samples for chemical analysis from the soil borings to evaluate soil quality;

3. Installed four (4) groundwater monitoring wells throughout the Site to establish groundwater flow and collected four (4) groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed five (5) soil vapor probes around Site perimeter and collected six (6) samples for chemical analysis.

The Phase II ESI identified the following:

1. The underlying subsurface consisted of 12 inches of concrete followed by soils consisting of brown fine to medium sand, dark brown sand, and brown sand with one or more of the following man-made materials (brick, wood, metal, and glass fragment), which are indicative of fill material, in each of the borings to depths ranging from eight (8) to 10 feet below ground surface (bgs). Below the identified fill material, the soils consisted of brown fine to medium sand and brown sandy silt to a termination depth of 15 feet bgs.
2. Cardno ATC observed black staining in SB-5 at a shallow depth. The results of the field screening did not identify any photoionization detector (PID) readings or a petroleum odor. No other borings exhibited any PID readings or visual/olfactory indications of impacted soils.
3. On June 5, 2013, Naeva Geophysics Inc., under the observation of Cardno ATC, arrived on-Site to perform a geophysical survey to identify subsurface structures, utilities, and anomalies throughout the Site so that they can be avoided during drilling activities and to investigate the potential presence of underground storage tanks (USTs). The equipment to be used included a Sensors and Software N250Plus cart-mounted Ground Penetrating Radar (GPR) unit with a 250 MHz antenna, a Radiodetection 4000T3 multi-transmitter, a Radiodetection 4000 receiver, and a Fisher TW-6 metallic locator. Naeva Geophysics Inc. began compiling data for the geophysical survey at the time a large rain event occurred. Preliminary data collected as part of the geophysical survey indicated that due to reinforced concrete throughout the Site the penetration of the survey would be limited to less than one (1) foot bgs. Based on the rain event and the preliminary data indicating that the survey would be limited in depth to less than one (1) foot bgs, the survey was not completed since the results would likely be inconclusive. Therefore, the geophysical survey was not able to investigate the potential presence of USTs at the Site.
4. Groundwater was encountered at 48.12 feet bgs in MW-1, 50.20 feet bgs in MW-2, 49.03 feet bgs in MW-3, and 48.75 feet bgs in MW-4. Based on the survey, the apparent groundwater flow direction is west-northwest.
5. Soil sampling results identified semivolatile organic compounds (SVOCs) above New York State Department of Environmental Conservation (NYSDEC) Subpart 375-6: Remedial Program Unrestricted Use Soil Cleanup Objectives (SCOs) and Restricted Residential Use SCOs in each of the soil samples collected. With the exception of SB-7 (12'-14'), none of the soil samples collected at depth (12'-14') had SVOCs above their laboratory method detection limits (MDLs). Lead was detected at a concentration of 1,910 milligrams per kilogram (mg/kg) above its Restricted Residential Use SCO in SB-1 (0-2'). The lead concentrations ranged from 99.7 mg/kg to 68 mg/kg, which are above its Unrestricted Use SCO of 63 mg/kg but below its Restricted Residential Use SCO of 400 mg/kg, in each of the other shallow soil samples collected and one (1) of the deep samples collected (SB-7 [12'-14']). Lead was detected in each of remaining deep soil samples below its Unrestricted

Use SCO . Pesticides were detected in the shallow soil samples and one (1) deep soil sample (SB-7 [12'-14']) above their Unrestricted Use SCO but below their Restricted Residential Use SCO. Acetone was the only VOC detected above applicable NYSDEC criteria in three (3) of the shallow samples collected. PCBs were not detected above their laboratory MDLs in the soil samples analyzed.

6. Groundwater sampling results identified methylene chloride in each of the groundwater samples slightly above its corresponding NYSDEC Part 703 and TOGS criteria. Methylene chloride is a common laboratory contaminant. The SVOCs fluoranthene, phenanthrene, and pyrene were detected below their corresponding NYSDEC TOGS Criteria in MW-4. No other SVOCs were detected above their laboratory MDL in the groundwater samples collected. Manganese and selenium were detected above their corresponding NYSDEC Part 703 and TOGS criteria in each of the filtered and unfiltered groundwater samples. Iron was detected above its corresponding NYSDEC Part 703 and TOGS criteria in the unfiltered groundwater sample but below the NYSDEC criteria in the filtered sample. No other metals were detected in groundwater samples above their corresponding NYSDEC Part 703 criteria, TOGS criteria and/or not detected above the laboratory MDL. Pesticides and PCBs were not detected above their laboratory MDLs in the groundwater samples analyzed.
7. Soil vapor sampling results identified benzene and ethylbenzene at concentrations above the New York State Department of Health (NYSDOH) Background Levels and United States Environmental Protection Agency (EPA) Shallow Soil Vapor Values in each the soil vapor samples analyzed. Carbon tetrachloride was detected in two (2) soil vapor samples at concentrations above the NYSDOH Background Levels and EPA Shallow Soil Vapor Value. 1,2,4-trimethylbenzene, acetone, carbon disulfide, chlorobenzene, cyclohexane, n-heptane, n-hexane, o-xylene, p- &m-xylene, p-ethyltoluene, toluene, Freon 111 were were detected at concentrations above the NYSDOH Background Levels but below the EPA Shallow Soil Vapor Values in one (1) or more of the soil vapor samples analyzed. None of the detected concentrations of compounds in the ambient air sample were above the NYSDOH Background Levels.

### **1.3 Visitors**

All visitors to the Site must be instructed about the hazards of the activities that ATC or its subcontractors are performing. All visitors must sign the ATC Visitors Log (see Appendix C).

## **2.0 - PROJECT ORGANIZATION**

All personnel and visitors who may enter work areas on this Site must comply with the requirements of this CHASP. All Site personnel have the authority to “Stop Work” if unsafe conditions are present. The specific responsibilities and authority of management, safety and health, and other personnel on this Site are detailed in the following sections.

### **2.1 Site Safety and Health Officer (SSHO)**

The Site Safety and Health Officer (SSHO) have the responsibility and authority to develop and implement this CHASP and to verify compliance. The SSHO reports to the Project Manager; both must be designated prior to commencement of work. The SSHO is on-site during all work operations and has the responsibility to halt Site work if unsafe conditions are detected. The responsibilities of the SSHO at the Site include the following:

- Managing the health and safety functions on the Site;
- Ensuring Site monitoring, worker training, and effective selection and use of PPE;
- Conducting daily Tailgate Safety Meetings for Site personnel and subcontractors and summarize the training on the Tailgate Meeting Form (see Appendix C). The following topics should be covered during safety meetings:
  - Hazard Communication (i.e., MSDS location, and container labeling, chemical hazards of non-routine tasks)
  - Determine applicability of Standard Operating Procedures (SOP) in Section 8 and communicate procedures
  - Review Site safety requirements
  - Give refresher training on heat or cold stress (Section 5.2 and 5.3) when appropriate
  - Review Site emergency procedures
  - Discuss location and use of a rig kill switch for drilling/boring operations
- Conducting daily safety inspections of the Site looking for unsafe acts or conditions and providing corrective action as appropriate.

### **2.2 Site Supervisor**

The Site Supervisor is responsible for field operations and reports to the Project Manager. The Site Supervisor is the On-site Coordinator and overseer of operations; both must be designated prior to commencement of work. It is the Site Supervisor's duty to maintain Site security, supervise the personnel on the Site, coordinate the activities of the subcontractor personnel, and check that the CHASP is followed and modified when necessary. The Site Supervisor's specific responsibilities include:

- Executing the work plan and schedule as detailed by the Project Manger
- Coordination with the SSHO on health and safety issues
- Ensuring Site work compliance with the requirements of the CHASP
- Before Site activities, contact the hospital emergency room, local fire department, and local police department, as applicable. If outside town, contact county officials and local emergency services.

### **2.3 Project Manager (PM)**

The Project Manager (PM) has the primary responsibility for the fulfillment of the terms of the contract and overseeing operations for the purpose that includes meeting legal and safety requirements. It is the PM's responsibility to keep the project on schedule, within budget, and communicate with the Client regarding the progress toward specified goals.

The PM will inform the Regional Safety Coordinator of all CHASP modifications, violations, injuries, exposures, and near-miss situations. The PM responsibilities include:

- Provide personnel time to read and understand the Site Construction Health and Safety Plan (CHASP) before fieldwork.
- Conduct project start-up health and safety briefing for: Field personnel, the Site Supervisor, the project team.
- Check that each subcontractor is pre-approved and that each subcontractor's Site workers have appropriate HAZWOPER Training Certificates.
- Check that Site personnel, if required, have received Respiratory Protection Training, Fit testing, and physician's approval to wear a respirator.
- That hazards identified during any Site audits are corrected. If necessary for immediate hazards, shut down field operations if hazards can not be corrected or the hazards present an immediate threat to life and health.

#### **2.4 Regional Safety Coordinator (RSC)**

The Regional Safety Coordinator (RSC) is responsible for providing professional health and safety advice and oversight management to the project. The RSC will review and provide support for concerns regarding the health and safety of field personnel assigned to this project, including:

- If requested by the Project Manager, approval of Routine CHASP;.
- Approval of all Non-Routine CHASP;
- Review of incident reports, inspections, and air monitoring results;
- When required, the RSC will conduct a field audit of the Site to evaluate the adequacy of the program and implement the necessary changes through the CHASP.

#### **2.5 Project Field Team**

The Project Team includes technicians, engineers, scientists, geologists, and possibly subcontractors who perform field activities. Each individual team member will be responsible for understanding and personally complying with the CHASP and Site health and safety requirements. Project Team members will report health and safety violations to either the Site Supervisor or the SSO. Health and safety responsibilities, as discussed in this Plan, which are shared by all Site personnel include:

- Complying with the requirements of the CHASP.
- Reporting unsafe acts or conditions
- Retain copies at the Site of the following health and safety records:
  - Current HAZWOPER Training Certificate.
  - Respiratory Protection Training Certificate and current fit test record for potential respirator users.
  - Physician's approval for hazardous-waste fieldwork and/or respirator use.
  - First-aid/CPR and blood borne pathogens training certificate.

### **3.0 – TASK/OPERATION HEALTH AND SAFETY RISK ANALYSIS SUMMARY**

This chapter of the CHASP describes the safety and health hazards associated with the Site work and control measures selected to protect workers. The purpose of the Job Safety Analysis (JSA) is to identify the routine safety and health hazards associated with the routine Site tasks and operations. Using this information, appropriate control methods are selected to eliminate the identified risks or effectively control them.

#### **3.1 Job Safety Analysis (JSA)**

Each specific JSA appears on a separate copy of the spreadsheets in Appendix A. A single JSA may be used for a task/operation performed in multiple locations if the hazards, potential exposures, and controls are the same at each location.

#### **3.2 Health Analysis and Chemical Risk Assessment**

The principal chemical contaminants that may be present, based on the results of the Phase II ESI, include, but are not limited to, VOCs, SVOCs, metals, PCBs, and pesticides. Appendix B contains information from the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards about each of these chemicals. Additionally, the Hazard Communication Program (Policy No. 21) requires ATC to provide employees, contractors, subcontractors, and visitors with information on the health effects of these chemicals and necessary actions to protect against exposure. This information is transmitted through Material Safety Data Sheets (MSDS), the NIOSH Pocket Guide, container labels, training, and a written Hazard Communication program.

Site activities will adhere to the ATC Hazard Communication Program as described in the Policy. All Site personnel, including subcontractors, will be briefed on this Program as part of the Site orientation training before starting work. In accordance with this Program, the PM and Site Supervisor will check that each chemical brought to the Site is accompanied by its MSDS. A copy of each MSDS will be made available to each Site employee who may be potentially exposed to the chemical. In addition, the Site Supervisor will check that all subcontractors bring at least one copy of MSDS for each chemical they bring onto the Site. The Site Supervisor will also check that all chemical containers brought to the Site to determine if they are labeled as to its contents and appropriate hazard warnings.

#### **3.3 Noise Hazards and Controls**

Exposure to high levels of noise may occur when working near heavy equipment. Also, depending upon where the work is being performed, local equipment (e.g., airports, factory machines, etc.) may produce high levels of noise. Employees exposed to noise levels in excess of the action level of 85 decibels (A-weighted, Slow Response) will be included into the ATC Policy on Hearing Conservation (Policy No. 34). The SSO may evaluate employee noise exposures using a Noise Survey Meter or a Noise Dosimeter. The RSC may conduct additional noise monitoring to determine the appropriate response to be taken. Employees will be provided with ear plugs and/or earmuffs when exposed to noise levels in excess of the 8-hour Permissible Exposure Limit (PEL) of 90 decibel (A-weighted, Slow Response). This hearing protection shall have a Noise Reduction Rating (NRR) to protect hearing in accordance with Policy No. 34, including the NRR de-rating factor of  $[(NRR-7)/2]$ .

### **3.4 Biological Hazards**

Site activities on this Site may expose workers to other hazards such as poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory protection equipment, and being capable of identifying poisonous plants, animals, and insects, can greatly reduce the chances of exposure. Thoroughly washing any exposed body parts, clothing, and equipment will also protect against infections. If working in wooded/grassy areas, use appropriate insect repellants (containing DEET and/or Permethrin) and apply them per the manufacturers' directions.

## 4.0 - AIR MONITORING AND PERSONAL PROTECTIVE EQUIPMENT

### 4.1 Site Air Monitoring Requirements

To prevent exposure to hazardous conditions and aid in the selection of personal protective equipment, monitoring for the presence of airborne contaminants will occur when knowledge of the Site indicates their potential presence. One or more of the following direct-reading instruments may be used to aid in this determination. Photoionization Detectors (PID) and Flame Ionization Detectors (FID) measures non-specific organic gases and vapors. Combustible Gas Indicators (CGI) will detect explosive atmospheres. Oxygen (O<sub>2</sub>) meters will detect fluctuations in oxygen concentrations. These instruments should be calibrated or bump tested daily and whenever the readings may be erratic. All readings should be recorded in the field log books.

Colorimetric detector tubes supplement PID and/or FID readings to measure specific gases and vapors. Other direct-reading instruments are available for use to monitor for the presence of specific airborne Site contaminants.

The breathing zone of the employee(s) anticipated to have the highest potential for exposure for each task will be monitored using an appropriate combination of some or all of these direct-reading instruments. Air monitoring should occur every 15 minutes during non-intrusive activities, or every 5 feet of penetration during intrusive activities. Site tasks and air monitoring requirements are shown in Table 4-1. Additional Site monitoring may occur at the discretion of the SSHO, Site Supervisor, or RSC.

**NOTE:** All air monitoring equipment must be calibrated as per manufacturer's instructions.

**Table 4-1  
Site Air Monitoring Requirements**

Site Activity	Instrument	Frequency	Location	Caution
<u>Soil Excavation</u>	PID	Every 15 minutes (during the periodic site visits)	In breathing zone of person nearest activity	Communicate with equipment operator before sampling (if sampling is deemed necessary)

Air monitoring will be performed during the periodic Site visits. Air monitoring results obtained from the breathing zone during field activities will be recorded in field logbooks and the Air Quality Monitoring Record (see Appendix C). All such records will also include the location, date/time, weather conditions, person monitored, background concentration, and identification of specific contaminant whenever possible. Air monitoring information will be utilized to evaluate personnel exposure and assess the appropriateness of PPE for Site conditions. The PPE for the Site are discussed in Section 4.2. Photoionization detector (PID) readings measured in the employees breathing zone will be used to determine the level of protection required. PID readings refer to readings above background, which are sustained for at least 5 minutes and are measured during the performance of field tasks. PID readings are used for general screening.

### 4.2 Action Levels for Personal Protection Equipment

The first and foremost means of protecting employees from injuries or exposures is to eliminate the exposure. The general hierarchy for controlling potential exposures is: (1) Engineering Controls; (2) Administrative Controls; and (3) the use of PPE. PPE is a means of preventing injury or exposure when exposure elimination and/or other control means are not feasible.

The initial level of protection and the Action Levels at which the PPE will be upgraded are determined based on the identification of specific chemicals expected to be present at a Site and the established OSHA Permissible Exposure Levels (PEL) or ACGIH Threshold Limit Values (TLVs), whichever is lower. In the event more than one chemical is expected or exists at a Site, the most hazardous chemical will dictate the level of personal protection required. Table 4-2 shows the action levels for levels of personal protection equipment.

**Table 4-2  
Action Levels for Personal Protection Equipment**

<b>Monitoring Equipment</b>	<b>Hazard</b>	<b>Action Level Above Background</b>	<b>Action</b>
PID/FID	Organic gas/vapor	< 10 ppm	Level D.
		10 to 50 ppm	Level C. Move upwind and continue air monitoring, cease operations, or use detector tube(s) for <u>(contaminant)</u> and reference Table 4-3 below.
		> 50 ppm	Immediate Withdrawal. Contact the PM and RSC for further instructions to proceed.

Detector tubes to be used are indicated for given ranges based upon the PID readings (Table 4-2). As appropriate, PID readings in conjunction with detector tubes will be utilized during the field activity and location anticipated having the highest level of contamination. This location will be selected by the Site Supervisor. If these measurements indicate exposure levels appropriate for Level D work, the use of detector tubes will be limited to situations where field conditions or activities have changed. Detector tubes will be available for use at the discretion of the Site Supervisor and the SSHO.

Any upgrading to higher levels of protection may require additional personal sampling using National Institute for Occupational Safety and Health (NIOSH) or Occupational Safety and Health Administration (OSHA) methods for the collection and analysis of airborne contaminants.

Air monitoring equipment used on the Site should be calibrated with the following:

Calibration/Response  
Check

<u>Types</u>	<u>Frequency</u>	<u>Gas Standard</u>
PID	Daily	100 ppm isobutylene in air

Field personnel, in conjunction with the Site Supervisor and SSHO, may choose to allow ventilation of vapors before resuming work (rather than using higher levels of PPE). If ventilation is conducted, additional air monitoring will be performed prior to the resumption of work to determine the level of PPE required.

### **4.3 Levels of Protection**

Levels of protection for Site activities are described on the Site Air Monitoring Summary. The protection levels may include all or some of the following, based on work scope.

#### Level D:

- Work uniform – Long pants and shirt with sleeves (no tank tops) – refer to Policy No. 25 Personal Protective Equipment (Section 5.5)
- Disposable, inner nitrile gloves
- Chemical-resistant boots with steel toe
- Safety glasses with side shields
- High Visibility Reflective Vest Class 1, Class 2, or Class 3 (select based on Traffic speed)
- Hard hat
- Disposable, chemical-resistant outer boot covers\*
- Hearing protection\*
- Apply sun-block to any/all exposed skin when working outdoors

#### LEVEL C:

- Half-face or full-face, air purifying respirator (NIOSH approved)
- Disposable, hooded, chemical-resistant clothing
- Disposable, chemical-resistant outer gloves
- Disposable, inner nitrile gloves
- Chemical-resistant boots with steel toe
- Disposable boot covers
- Hard hat
- Safety Glasses with side shields
- High Visibility Reflective Vest Class 1, Class 2, or Class 3 (select based on Traffic speed)
- Coveralls\*
- Hearing protection\*

(\* Optional Equipment, depending on conditions/exposures)

#### **4.4 Respiratory Protection**

Respiratory protection requirements are described in detail in the ATC Respiratory Protection Program. Basic rules of respiratory usage are listed below:

- Facial hair that interferes with a satisfactory fit of the mask-to-face seal is not allowed on personnel required to wear respirators.
- Respirator cartridges should be replaced after approximately 8-hours of continuous or intermittent usage, unless otherwise noted. Cartridges should also be replaced if they become damaged, after the expiration date is exceeded, if vapor smell breakthrough occurs, or if filters become clogged causing resistance to breathing.
- Contact lenses may be worn when respiratory protection is required, in conjunction with additional eye protection to protect against particles or splashes, provided there is no interference with the respirator seal.
- Respirators shall be cleaned and disinfected after each day's use or more often, if necessary.
- Prior to donning, respirators will be inspected for worn or deteriorated parts. Emergency respirators or self-contained devices will be inspected at least once a month and after each use.
- After donning, personnel should perform a positive and negative user fit-check to determine if a good seal has been achieved.
- Each employee shall make sure that they have an annual respirator fit test and respiratory protection training.

## **5.0 - HEALTH SURVEILLANCE PROGRAM**

### **5.1 Employee Medical Examinations**

All ATC employees involved in work at the Site will participate in ATC's Medical Surveillance Program administered by Health Resources. Additionally, when respirators are required (as determined by the SSHO and project manager), each employee will also have current respirator clearance.

A post project, follow-up exam may be required if an exposure incident is reported or an employee shows specific symptoms associated with the known or suspected hazardous chemicals. The RSC and the Project Manager will determine when post project exams are required.

### **5.2 Heat Stress Program**

This procedure applies to all employees when heat stress conditions exist at project sites.

#### **5.2.1 Training**

The SSHO will have received acceptable training in first-aid and Cardiopulmonary Resuscitation (CPR), including training in heat-related illnesses. The SSHO shall also be trained on the requirements of the ATC Policy for Industrial Hygiene (Policy No. 23), which contains the requirement for Heat Stress monitoring. All workers should be capable of recognizing and treating the signs and symptoms of heat stress conditions. During potential heat stress conditions, ice should be readily available to rapidly cool victims.

#### **5.2.2 Fluid Replacement**

Water will be made available at the Site for employee fluid replacement. When heat stress is determined to be a problem by the SSHO, employees will be provided with balanced, electrolyte solutions to replace fluid and electrolyte loss. Employees will be provided with replacement fluids at a minimum rate of 8 ounces every 15 to 20 minutes per person.

#### **5.2.3 Acclimatization**

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full-heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the work activity in the heat stress conditions is discontinued. A noticeable loss usually occurs within 3 – 4 days.

#### **5.2.4 Rest Breaks**

When heat stress conditions are applicable, all rest breaks should be taken out of the zone of exclusion into a cooler, shaded, rest area. If these conditions are not available, more frequent rest breaks will be taken.

#### **5.2.5 Heat Stress Monitoring**

Heat Stress and heat strain are conditions resulting from environmental factors including temperature, relative humidity, radiant heat transfer, and air movement, as they are affected by clothing. The primary objective of the heat stress management program is to prevent heat stroke which is life threatening and the most serious of the heat-induced disabilities. Extra caution should be taken for workers who are not acclimated to working in the heat.

The following Heat Stress Index (refer to ATC Policy No. 23) should be used as a guide to evaluate heat stress situations. If the Heat Stress exceeds 105° F, contact the RSC prior to work for detailed guidance.

<b>Heat Stress Index</b>									
<b>Temp.</b> °F	<b>Relative Humidity</b>								
	<b>10%</b>	<b>20%</b>	<b>30%</b>	<b>40%</b>	<b>50%</b>	<b>60%</b>	<b>70%</b>	<b>80%</b>	<b>90%</b>
<b>105</b>	<b>98</b>	<b>104</b>	<b>110</b>	<b>120</b>	<b>132</b>				
<b>102</b>	<b>97</b>	<b>101</b>	<b>108</b>	<b>117</b>	<b>125</b>				
<b>100</b>	<b>95</b>	<b>99</b>	<b>105</b>	<b>110</b>	<b>120</b>	<b>132</b>			
<b>98</b>	<b>93</b>	<b>97</b>	<b>101</b>	<b>106</b>	<b>110</b>	<b>125</b>			
<b>96</b>	<b>91</b>	<b>95</b>	<b>98</b>	<b>104</b>	<b>108</b>	<b>120</b>	<b>128</b>		
<b>94</b>	<b>89</b>	<b>93</b>	<b>95</b>	<b>100</b>	<b>105</b>	<b>111</b>	<b>122</b>		
<b>92</b>	<b>87</b>	<b>90</b>	<b>92</b>	<b>96</b>	<b>100</b>	<b>106</b>	<b>114</b>	<b>122</b>	
<b>90</b>	<b>85</b>	<b>88</b>	<b>90</b>	<b>92</b>	<b>96</b>	<b>100</b>	<b>106</b>	<b>114</b>	<b>122</b>
<b>88</b>	<b>82</b>	<b>86</b>	<b>87</b>	<b>89</b>	<b>93</b>	<b>95</b>	<b>100</b>	<b>106</b>	<b>115</b>
<b>86</b>	<b>80</b>	<b>84</b>	<b>85</b>	<b>87</b>	<b>90</b>	<b>92</b>	<b>96</b>	<b>100</b>	<b>109</b>
<b>84</b>	<b>78</b>	<b>81</b>	<b>83</b>	<b>85</b>	<b>86</b>	<b>89</b>	<b>91</b>	<b>95</b>	<b>99</b>
<b>82</b>	<b>77</b>	<b>79</b>	<b>80</b>	<b>81</b>	<b>84</b>	<b>86</b>	<b>89</b>	<b>91</b>	<b>95</b>
<b>80</b>	<b>75</b>	<b>77</b>	<b>78</b>	<b>79</b>	<b>81</b>	<b>83</b>	<b>85</b>	<b>86</b>	<b>89</b>
<b>78</b>	<b>72</b>	<b>75</b>	<b>77</b>	<b>78</b>	<b>79</b>	<b>80</b>	<b>81</b>	<b>83</b>	<b>85</b>
<b>76</b>	<b>70</b>	<b>72</b>	<b>75</b>	<b>76</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>78</b>	<b>79</b>
<b>74</b>	<b>68</b>	<b>70</b>	<b>73</b>	<b>74</b>	<b>75</b>	<b>75</b>	<b>75</b>	<b>76</b>	<b>77</b>

**NOTES: Add 10° F when protective clothing is being used; Add 10° F when in direct sunlight**

<b>HSI Temp</b>	<b>Category</b>	<b>Injury Threat</b>
<b>Above 130° F</b>	<b>Extreme Danger</b>	No work unless emergency exists. Contact ATC RSC and Corporate Risk Management Department prior to proceeding. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
<b>105° to 130° F</b>	<b>Danger</b>	Contact RSC prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
<b>90° to 105° F</b>	<b>Extreme Caution</b>	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
<b>80° to 90° F</b>	<b>Caution</b>	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
<b>Below 80° F</b>	<b>Normal Range</b>	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

### **5.3 Cold Stress Program**

This procedure applies to all employees who perform field work in cold environments at risk of cold stress injury and intended to protect workers from the most severe effects of cold stress.

#### **5.3.1 Training**

ATC Site employees have been trained in cold stress as part of their HAZWOPER 40-hour initial training. Site workers will receive refresher training by the SSHO in cold stress safety and health procedures. The training program will include, as a minimum, instruction in the following areas:

- Proper first-aid treatment
- Proper clothing practices
- Proper eating and drinking habits
- Recognition of impending frostbite
- Recognition of the signs and symptoms of impending hypothermia or excessive cooling of the body when shivering does not occur
- Safe working practices

The SSHO will be trained in first-aid, CPR, and cold stress conditions.

#### **5.3.2 Environmental Monitoring**

Frostbite and hypothermia are two types of cold injury that personnel must be protected against during the performance of field duties. The objective is to prevent the deep body temperature from falling below 96.8° F and to prevent cold injury to body extremities. Two factors influence the development of a cold injury the ambient temperature, and wind velocity.

The SSHO will monitor environmental conditions by recording ambient temperature and estimated wind-speed. Information contained in Tables 5-1 and 5-2 will be used to evaluate the possibility of hypothermia among workers on-site.

#### **5.3.3 Protective Clothing and Rest Breaks**

Use appropriate cold weather clothing when temperatures are at or below 40°F as exposed skin surfaces must be protected. These protective items can include facemask, hand wear, and foot wear. Workers handling evaporative solvents during cold stress conditions will take special precautions to avoid soaking gloves and clothing because of the added danger of prolonged skin contact and evaporative cooling. Personnel will wear protective clothing appropriate for the level of cold and planned physical activity. The objective is to protect all parts of the body, with emphasis on the hands and feet. Eye protection against glare and ultraviolet light should be worn in snowy and icy conditions.

The work rate should not be so great as to cause heavy sweating that could result in wet clothing. If heavy work must be done, opportunities for rest breaks will be provided where workers have the opportunity to change into dry clothing. Conversely, plan work activities to minimize time spent sitting or standing still. Rest breaks should be taken in a warm, dry area. Windbreaks can also be used to shield the work area from the cooling effects of wind.

#### **5.3.4 Identification and Treatment of Cold Stress**

When frostbite, hypothermia, or other cold stress symptoms are suspected, treat the patient to relieve symptoms or transport them to the medical facility identified on page TC-4.

**TABLE 5-1**  
**Threshold Limit Values Work/Warm-up Schedule**  
**for Four-Hour Shift\***

Air-Temperature--Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx.)	°F (approx.)	Max. Work Period	No. of Breaks								
-26° to -28°	-15° to -19°	(Norm. Breaks) 1		(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min	3	40 min	4	30 min	5	Non-emergency work should cease		Non-emergency work should cease	
-38° to -39°	-35° to -39°	40 min	4	30 min	5	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease	
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

- \*1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten. (10) Minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule on step lower. For example, at -35°C (-30°F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises a newspaper sheet; 20 mph: blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be 1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 watts per square meter (W/m<sup>2</sup>); 2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly overcompensates for the actual temperatures in the cooler ranges because windy conditions rarely prevail at extremely low temperatures.
4. TLVs apply only for workers in dry clothing.

\* Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labor.

**TABLE 5-2**  
**Cooling Power of Wind on Exposed Flesh Expressed as**  
**Equivalent Temperature (under calm conditions)\***

Estimated Wind Speed (mph)	Actual Temperature Reading (degrees F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent chill Temperature (degrees F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds > 40 mph have little additional effect)	LITTLE DANGER If < hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute.				GREAT DANGER Flesh may freeze within 30 seconds.			
	Trench foot and immersion foot may occur at any point on this chart.											

\* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA

## 6.0 - SITE SECURITY AND CONTROL

### 6.1 Work Zones

Restricted Site areas will include, but not necessarily be limited to, the following zones:

- **Exclusion Zone or Hot Zone** - any area where contamination is either known or likely to be present in concentrations that could pose a threat to human health and safety or that potential for harm to personnel exists because of the type of work activities being conducted. Appropriate PPE and warning signs should be utilized in this area.
- **Contamination Reduction Zone** - any area where workers conduct personal and equipment decontamination.
- **Support Zone** - areas where access is controlled, but the chance to encounter hazardous materials or conditions are minimal.

Access to the work zones will be controlled by work zone delineators (e.g. traffic cones, flags, vehicles, DOT approved devices, temporary or permanent fencing, and/or safety barrier tape). Figure 6-1 is an example of a work zone. Additionally ATC employees should follow the requirements of the Employee Health and Safety Policy Manual, Policy No. 36, Work Zones in Traffic Areas for additional information.

In the event on-site personnel must upgrade their personal protective equipment, the work zones may require substantial modification in order to provide for the safety of nearby personnel not associated with this work. Any upgrade level will be communicated by the Site Supervisor to the PM. The PM will then inform the RSC of this occurrence.

<u>Work Zone</u>	<u>Level of Protection</u>	<u>Required Protective Equipment (specify Exact type, e.g. nitrile gloves)</u>	
Exclusion Zone	_____	Respirator:	Yes
		Filters/Cartridges:	Organic – N/A
		Boots:	Yes
		Inner Gloves:	Nitrile
		Outer Gloves:	Nitrile
		Protective Coverall:	Tyvek
		Hard Hat:	Yes
		Eye Protection:	Yes
		Other:	Reflective Vests, Hearing Protection where needed

Contamination	_____	Respirator:	_____
Reduction Zone	_____	Filters/Cartridges:	_____
		Boots:	Yes
		Inner Gloves:	_____
		Outer Gloves:	_____
		Protective Coverall:	_____
		Hard Hat:	Yes
		Eye Protection:	Yes
		Other:	_____

Exceptions and Modifications:

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## 6.2 Buddy System

The Buddy System will be used at all times by field personnel in the Exclusion Zones. The Buddy System means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of emergency. No one is to perform fieldwork without the approval of the Branch Safety Officer and/or the Regional Safety Officer.

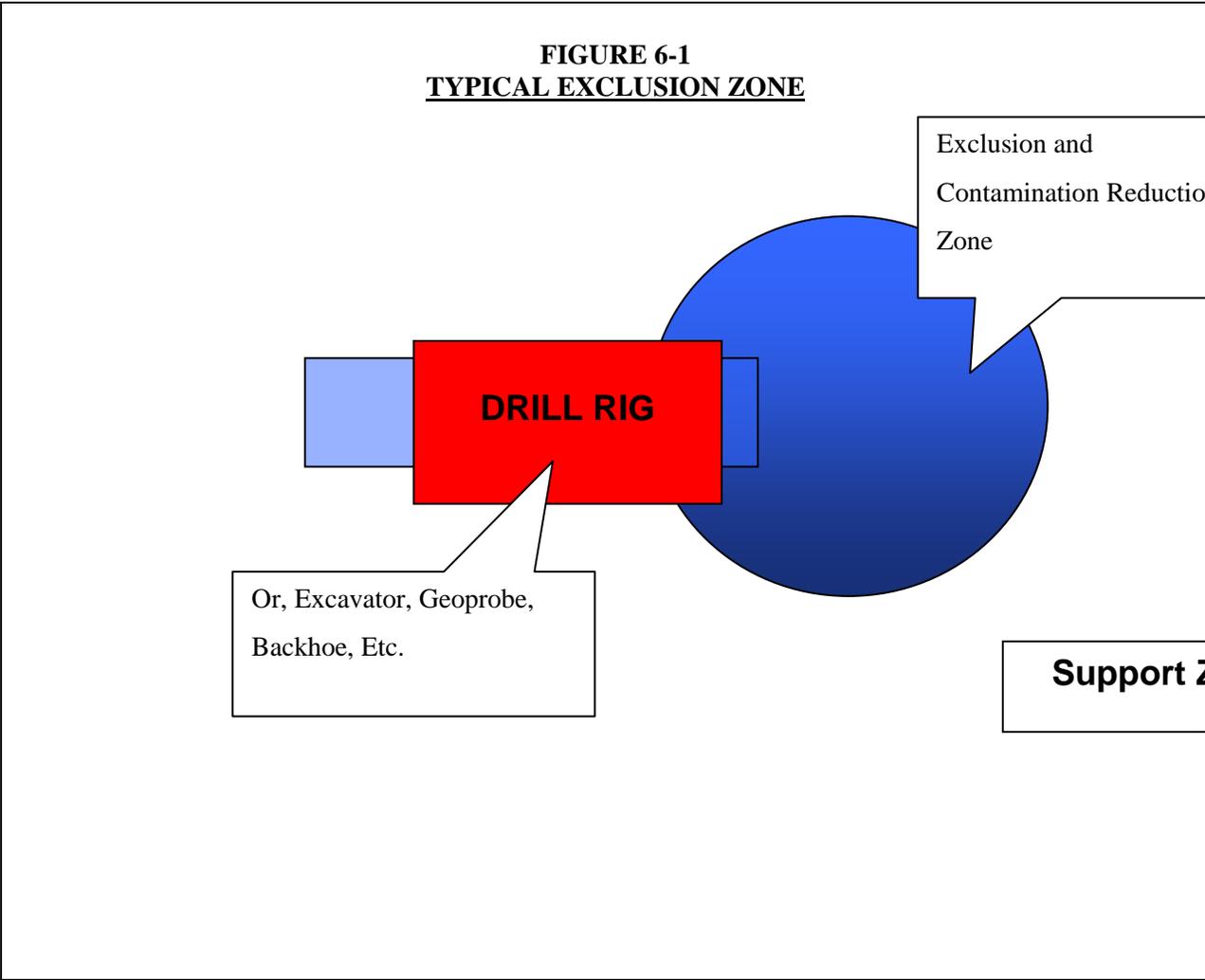
## 6.3 Site Communication

A loud and clear form of communication should be made available for Site personnel entering the work zones. Site communication may be in the form of hand signals, voice, or other communication devices. All forms of communication should be understood by all workers on the Site prior to starting work.

## 6.4 Roadway Work Zones

When ATC employee and subcontractors are required to perform Site operation in a city street or public right-of-way, a Traffic Control Plan may be required and included with this CHASP. Check with the State or local government Department of Transportation for when a traffic control plan is required. Traffic Control Plans will include Transition Areas, Activity Areas, and Termination Areas.

**FIGURE 6-1**  
**TYPICAL EXCLUSION ZONE**



## 7.0 - DECONTAMINATION PROCEDURES

### 7.1 Personnel Decontamination

All personnel must complete appropriate decontamination procedures in a way that is responsive to actual Site conditions before leaving the Site. The decontamination of personnel and equipment will be performed within the exclusion and contamination reduction zones. Wash tubs containing an appropriate decon solution and soft bristle brushes will be used to decontaminate personal protective clothing and boots. Deionized water will be used for the final rinse. The SSHO will visually inspect all PPE and other equipment once decontamination procedures are completed. In general, the four types of decontamination solutions to be considered for PPE include:

- Water for removal of low-molecular weight hydrocarbons, inorganic compounds, salts, some organic acids, and other polar compounds.
- Dilute acids (vinegar) for removal of basic (caustic) compounds, amines, and hydrazine's.
- Dilute bases (soaps and detergents) for removal of acidic compounds, phenols, thiols, and some nitro and sulfonic compounds.
- Organic solvents for removal of nonpolar compounds (organic).

#### LEVEL D/LEVEL C

- Establish a segregated equipment drop
- Remove disposable, outer boot covers, if applicable
- Remove chemical resistant, outer gloves, if applicable
- Remove hard hat and goggles, safety glasses, or face shield
- Remove disposable, inner gloves
- Remove full-face air purifying respirator (Level C only)

Each individual will be responsible for inspecting and decontaminating their own respirator in accordance with the ATC Respiratory Protection Program (Policy No. 27).

At a minimum the hands and face of each employee must be thoroughly washed upon leaving the work area. Trash receptacles will be provided for all disposable clothing. Commercial laundries or cleaning establishments that decontaminate clothing or equipment will be informed of the potentially harmful effects of exposure.

Decontamination Solution: Soap and water, fresh rinse

STATION #1: Wash hands, dispose of outer gloves and coveralls

Equipment Required: Wash basin

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### 7.3 Disposition of Decontamination Wastes

All materials and equipment used for decontamination should be disposed of in accordance with local, State, and/or Federal Regulations. Clothing, tools, buckets, brushes, and all other equipment that is contaminated must be properly packaged and stored on the Site until disposal arrangements are finalized. Clothing not completely decontaminated on-site should be secured in plastic bags before being removed from the Site.

#### Decontamination Waste Water

Collection (specify how): Wash basin

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Direct Discharge (specify how and where): 55-gallon drum

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Pre-Treatment (specify): None

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Disposal (specify how and where): Contractor

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## **8.0 - STANDARD OPERATING PROCEDURES**

The following Standard Operating Procedures (SOPs) will be applied to each location and activity where work is performed on a hazardous chemical site. As hazards increase or decrease on the Site, the applicability of each SOP must be determined by the SSHO with the approval of any changes by the Project Manager or the RSC.

### **8.1 Personnel Precautions**

1. Eating, drinking, chewing gum or tobacco, smoking, and any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the exclusion and contamination reduction zone or in any area known to be contaminated.
2. When decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
3. Contact with contaminated or suspected contaminated surfaces should be avoided. When possible, do not walk through puddles, leachate, or discolored surfaces; kneel on the ground; or lean, sit, or place equipment on drums, containers, or the ground.
4. Medicines and alcohol can increase the effects from exposure to toxic chemicals. Personnel should not take prescribed drugs at hazardous waste operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage intake should be minimized or avoided.
5. All personnel must be familiar with Standard Operating Procedures and any additional instructions and information contained in this CHASP. All visitors and subcontractors will read the CHASP before entering the Site.
6. All personnel will be aware of symptoms for heat or cold stress.
7. All personnel will be familiar with the chemicals used on-site and the associated hazards as described in each respective MSDS. The MSDS for the chemicals on-site will be available and located in the company vehicle.

### **8.2 Operations**

1. All personnel going to the Site must be adequately trained and thoroughly briefed on anticipated hazards, equipment, safety practices, emergency procedures, and communications.
2. Personnel on the Site must use the Buddy System when engaged in Level C work as specified in ATC Policy No. 35 (Hazwoper). The purpose of the Buddy System is to provide rapid assistance to employees in the event of an emergency.
3. Visual contact must be maintained between pairs of Site and safety personnel. Entry team members should remain close to assist each other during emergencies.
4. Personnel should practice unfamiliar operations before the actual procedure.

5. Entrance and exit locations must be designated, and emergency escape routes delineated. Warning signals for Site evacuation must be established by the SSHO before field activities.
6. Communications using radios, hand signals, or other means, must be maintained between initial entry members at all times. Emergency communications should be prearranged in case of radio failure, the necessity for evacuating the Site, or other reasons.
7. Wind indicators visible to all personnel should be strategically located throughout the Site.
8. Personnel and equipment in the contaminated area should be minimized, consistent with effective Site operations.
9. Work areas for various operational activities will be established.
10. Procedures for leaving a contaminated area will be planned and implemented before going to the Site. Work areas and decontamination procedures will be established based on expected Site conditions.
11. Frequent and regular inspections of Site operations will be conducted by the SSHO to check compliance with this CHASP. If changes in operation occur, the CHASP must be modified to reflect these changes.
12. All electrical equipment (power tools, extension cords, instruments, radios, etc.) will conform with ATC Policy No. 12 (Electrical) The SSHO will ensure that electrical equipment is free from recognized hazards that may cause physical harm to employees.
13. Fire prevention and protection (appropriate signs for flammable liquids, smoking areas, storage areas of combustible or flammable materials, etc.) will be according to ATC Policy No. 18, Fire Protection.
14. Site Tailgate Safety Meetings will be held daily to discuss anticipated Site conditions and daily activities. This meeting will be summarized in field logbooks and the Tailgate Safety Meeting Form (see Appendix C).

## 9.0 - CONTINGENCY PLAN

This chapter of the CHASP describes potential emergencies at this Site and the procedures for responding to those emergencies.

### 9.1 Medical Emergencies

1. The name, address, telephone number, travel distance, and travel time to the nearest medical treatment facility are found in the Emergency Information section (see Page TC-4) of this CHASP. A map and direction for locating the facility is available in the Emergency Information section (see Page TC-6) of this CHASP.
2. Emergency routes will be verified and driven before any Site activities. It may be quicker to transport a person with minor injuries than to wait for Emergency Medical Services (EMS) to respond. Check with the local authorities for response times. Life threatening emergency situations will only be handled by emergency medical services.
3. Before mobilization on-site, the Site Supervisor will contact the local hospital emergency room personnel, local fire department, and local police department to brief them regarding the scope and hazards associated with the scheduled fieldwork. If the Site is outside an established town, contact will be made with county officials and local emergency services.
4. An emergency first-aid kit with contents per ATC Policy No. 20 (First-Aid) will be readily available (if corrosive materials are present) on the Site, and personnel will have first-aid training. The first-aid kit also contains equipment necessary to protect first-aid providers against exposure to blood borne pathogens. All first-aid providers will have received Blood borne Pathogens training and can receive Hepatitis B vaccinations according to the ATC Policy No. 09 (Blood borne Pathogens) if exposed to bodily fluids.
5. Any person who becomes ill or injured in the exclusion zone must be decontaminated as well as possible with consideration to which risk will be greater, the spread of contamination or the health of the individual. If the injury or illness is minor, full decontamination (remove contaminated clothing and wash hands and face with soap and water, See Section 7.0) should be completed and first-aid administered before transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First-aid should be administered while awaiting an ambulance or paramedics.
6. The following steps should be followed if an injury or illness case occurs:
  - Check the Scene.
  - If safe to do so, check the condition of the injured.
  - Call 911 if the victim is unconscious or your training dictates to do so.
  - Care for the injured. Always use "Universal Precautions".
  - Call COMP-CARE (800) 756-1130, if the injury is non-life threatening. COMP-CARE will assist you with the location of the nearest clinic, if referral is needed.
7. Provisions must be made to identify the substance to which the worker has been exposed. This information must be given to medical personnel.

## 9.2 Emergency Equipment

1. A personal eyewash unit that meets ANSI Z358.1-1998, Section 6 will be available in each ATC field vehicle at the Site if corrosive chemicals (chemicals with a pH of <3 or >11) will be on-site.
2. An emergency first-aid kit with contents as per ATC Policy No. 20 (First-Aid). The Site Supervisor shall be trained and certified in first-aid and CPR.
3. An emergency spill cleanup kit will be available at the Site at all times. Unplanned releases will be reported to the SSHO and/or Site Supervisor as soon as possible.
4. Sufficient water and/or multipurpose dry chemical (Class A, B, and C) fire extinguishers, rated not less than 2A:10B:C will be maintained on the Site to cope with any situation until emergency services arrive.

## 9.3 Flammable Conditions

In the event that combustible vapors exceed 10 percent of the LEL or strong odors are detected in the borehole, the following actions should be taken:

- Continue investigation using extreme caution. Personal protective equipment may need to be upgraded.
- Allow vapors to dissipate or use intrinsically-safe mechanical ventilation.
- If atmospheric conditions do not change, call in the listed sequence:
  - Project Manager
  - Regional Safety Coordinator
  - Fire Department
- Provide answering personnel with the call back numbers, locations, directions, and situation assessment.

## 9.4 Site Evacuation Conditions

The following conditions will necessitate the cessation of field work in the area of concern, withdrawal from the work area, and revisions to this CHASP:

- Fires and/or explosions
- Unexploded ordnance is detected
- A major incident or injury occurs
- Flammable atmosphere readings above 10 percent LEL
- Oxygen readings above 23.5 percent oxygen concentration
- Oxygen readings at or below 19.5 percent oxygen concentration
- PID readings over 50 ppm sustained for more than 5 minutes

## 9.5 Emergency Communication System

Emergency contacts and telephone numbers are provided at the beginning of this CHASP. Field crews will have some communication device at each active work location. These may include radios, mobile telephones, or walkie-talkies. Such communication devices will have sufficient range to contact the field office and/or emergency services. If an emergency occurs on-site, the Site Supervisor is responsible for checking that appropriate emergency contact has been notified. At the time of the emergency response, the Site Supervisor or designee will brief the emergency personnel on the status of the emergency, including Site conditions.

Field personnel will use hand signals if there are noisy working conditions on the Site. The hand signals that will be used are shown below and will be reviewed by the SSHO during the on-site safety briefing.

<b>Signal</b>	<b>Meaning</b>
Hands on top of head	Need assistance
Grip partner's wrist or place both hands around partner's arm	Leave area immediately
Thumbs up	OK; I am all right
Thumbs down	No; Negative
Hand gripping throat	Cannot breathe; Out of air

## 9.6 Emergency Response Follow-Up

If there is an incident, near-miss, or emergency response, the SSHO will notify the Project Manager and Regional Safety Coordinator. The Project Manager or the Branch Safety Officer will complete a Supervisor's Investigation Report (SIR) (Policy No. 51; Appendix 51-1) and submit to the appropriate Regional distribution list. Prior to resuming work, a Site safety meeting should be held to discuss the circumstances surrounding the incident and what should be done to prevent a re-occurrence.

## **10.0 - EMPLOYEE TRAINING**

### **10.1 Pre-Assignment and Annual Refresher Training**

All ATC Employees and Subcontractors will participate in routine health and safety education and training programs. These programs are designed to provide employees with a thorough knowledge of hazardous materials, health and safety hazard potential, and Federal Occupational Safety and Health Administration (OSHA) requirements published in 29 Code of Federal Regulations (CFR) Part 1910. According to 29 CFR 1910.120(e), Site employees will have received 40 hours of initial Hazardous Waste Operations & Emergency Response (HAZWOPER) instruction and 24 hours of supervised field experience. Attending an annual 8-hour HAZWOPER refresher training session maintains this initial training. It is the responsibility of the Project Manager and each subcontractor's supervising manager to determine if the subcontractor staff meets these training requirements.

### **10.2 Site Supervisor's Training**

On-site Managers and Supervisors on hazardous waste sites who are directly responsible for or who supervise workers engaged in hazardous wastes operations receive, in addition to the initial 40 HAZWOPER training, 8 additional hours of specialized supervisory training in compliance with the OSHA regulations. This training includes training on the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazards monitoring procedure and techniques.

### **10.3 Site Safety Training and Briefing Topics**

The SSHO will conduct Site-specific health and safety briefing for field personnel before the start of all field work. Briefing attendees will include the Site Supervisor, the Project Team, and Subcontractor personnel. At the conclusion of the meeting, personnel are to sign the CHASP Agreement and Acknowledgement Form in the Appendices. As additional people are assigned to the Site, it is the responsibility of the SHSO to ensure that new personnel are briefed on health and safety protocols and ensure that they have reviewed and signed the CHASP Agreement and Acknowledgement Form. Items to be covered include:

- Site-specific health and safety rules
- Client-specific health and safety rules
- Health effects of various chemicals used on the Site
- Emergency response actions pertaining to operations on-Site

Additionally, daily Site Tailgate Safety Meetings will be conducted to review past activities, plan ahead for new or changed operations, to understand any near-miss and "lessons learned, establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation. The SSHO will complete the Tailgate Safety Meeting Form located in the Appendices.

### **10.4 Visitors**

All visitors entering the designated work zones will be subject to all applicable health and safety requirements during field operations at the Site. All visitors to a work Site will be given the opportunity to review the CHASP, will be escorted at all times, and will be required to stay a safe distance from Site activities. The Site Supervisor and/or the SSHO will be responsible for briefing all visitors on the Site hazards, Site safety precautions, and the Site emergency response plan.

**APPENDIX A**  
**Job Safety Analysis (JSA)**

## Job Safety Analysis (JSA)

Date of Analysis: 9/10/2013 JSA Conducted By: John Mascioli JSA No. 1

Job Title: Project Manager Department: Environmental

Job Description: Potential contact with impacted soil during excavation for proposed construction

Job Location: Fulton South – 1328 Fulton Street, Brooklyn, New York 11216

<b>(1) Job Segments &amp; Steps</b>	<b>(2) Potential Hazards</b>	<b>(3) Safe Procedures &amp; Preventive Measures</b>
Walking around construction site	<ul style="list-style-type: none"> <li>• Direct Contact with soil</li> </ul>	<ul style="list-style-type: none"> <li>• Wear proper gloves, and other PPE</li> </ul>
	<ul style="list-style-type: none"> <li>• Tripping hazards</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain a clear path between locations.</li> <li>• Limit the amount of tools or supplies that are carried so that you can still see the ground.</li> </ul>
	<ul style="list-style-type: none"> <li>• Heavy equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Only approach after the spotter indicates it is safe to do so.</li> <li>• Wear a reflective vest</li> <li>• Don't assume that the operator sees you.</li> </ul>
	<ul style="list-style-type: none"> <li>• Excavation – falls and collapse</li> </ul>	<ul style="list-style-type: none"> <li>• Do not enter the excavation</li> <li>• Stay back at least 2 feet from the edge of the excavation.</li> </ul>
Working near large machinery/equipment	<ul style="list-style-type: none"> <li>• Being hit by equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Only approach after the spotter indicates it is safe to do so.</li> <li>• Wear a reflective vest</li> </ul>

**APPENDIX B**  
**Chemical Hazard Information**

## **CHEMICAL LISTING**

Acetaldehyde		Formula: CH <sub>3</sub> CHO	CAS#: 75-07-0	RTECS#: AB1925000	IDLH: Ca [2000 ppm]
<b>Conversion:</b> 1 ppm = 1.80 mg/m <sup>3</sup>		<b>DOT:</b> 1089 129			
<b>Synonyms/Trade Names:</b> Acetic aldehyde, Ethanal, Ethyl aldehyde					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A See Appendix C (Aldehydes)			OSHA PEL†: TWA 200 ppm (360 mg/m <sup>3</sup> )		<b>Measurement Methods</b> (see Table 1): NIOSH 2018, 2538, 3507 OSHA 68
<b>Physical Description:</b> Colorless liquid or gas (above 69°F) with a pungent, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 44.1 BP: 69°F Sol: Miscible F.I.P.: -36°F IP: 10.22 eV Sp.Gr: 0.79 VP: 740 mmHg FRZ: -190°F UEL: 60% LEL: 4.0% Class IA Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, bases, alcohols, ammonia & amines, phenols, ketones, HCN, H <sub>2</sub> S [Note: Prolonged contact with air may cause formation of peroxides that may explode and burst containers; easily undergoes polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; eye, skin burns; dermatitis; conj; cough; CNS depress; delayed pulm edema; in animals: kidney, repro, terato effects; [carc] TO: Eyes, skin, resp sys, kidneys, CNS, repro sys [in animals: nasal cancer]			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

Acetic acid		Formula: CH <sub>3</sub> COOH	CAS#: 64-19-7	RTECS#: AF1225000	IDLH: 50 ppm
<b>Conversion:</b> 1 ppm = 2.46 mg/m <sup>3</sup>		<b>DOT:</b> 2790 153 (10-80% acid); 2789 132 (>80% acid)			
<b>Synonyms/Trade Names:</b> Acetic acid (aqueous), Ethanoic acid, Glacial acetic acid (pure compound), Methanecarboxylic acid [Note: Can be found in concentrations of 5-8% in vinegar.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (25 mg/m <sup>3</sup> ) ST 15 ppm (37 mg/m <sup>3</sup> )			OSHA PEL: TWA 10 ppm (25 mg/m <sup>3</sup> )		<b>Measurement Methods</b> (see Table 1): NIOSH 1603 OSHA ID186SG
<b>Physical Description:</b> Colorless liquid or crystals with a sour, vinegar-like odor. [Note: Pure compound is a solid below 62°F. Often used in an aqueous solution.]					
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 244°F Sol: Miscible F.I.P.: 103°F IP: 10.66 eV Sp.Gr: 1.05 VP: 11 mmHg FRZ: 62°F UEL(200°F): 19.9% LEL: 4.0% Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact (>10%) Eyes: Prevent eye contact Wash skin: When contam (>10%) Remove: When wet or contam (>10%) Change: N.R. Provide: Eyewash (>5%) Quick drench (>50%)		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 50 ppm: Sa:CfE/Pap/OvE/CrFOv/ GmFOv/ScbaF/SaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (especially chromic acid, sodium peroxide & nitric acid), strong caustics [Note: Corrosive to metals.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Irrit eyes, skin, nose, throat; eye, skin burns; skin sens; dental erosion; black skin, hyperkeratosis; conj, lac; phar edema, chronic bron TO: Eyes, skin, resp sys, teeth			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Acetic anhydride</b>		<b>Formula:</b> (CH <sub>3</sub> CO) <sub>2</sub> O	<b>CAS#:</b> 108-24-7	<b>RTECS#:</b> AK1925000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 4.18 mg/m <sup>3</sup>		<b>DOT:</b> 1715 137			
<b>Synonyms/Trade Names:</b> Acetic acid anhydride, Acetic oxide, Acetyl oxide, Ethanoic anhydride					
<b>Exposure Limits:</b> NIOSH REL: C 5 ppm (20 mg/m <sup>3</sup> ) OSHA PEL†: TWA 5 ppm (20 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 3506 OSHA 82, 102	
<b>Physical Description:</b> Colorless liquid with a strong, pungent, vinegar-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 102.1 BP: 282°F Sol: 12% Fl.P: 120°F IP: 10.00 eV Sp.Gr: 1.08 VP: 4 mmHg FRZ: -99°F UEL: 10.3% LEL: 2.7% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>125 ppm:</b> Sa:Cf£/PaprvOv£ <b>200 ppm:</b> CcrFOv/GmFOv/PaprvOv£/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Water, alcohols, strong oxidizers (especially chromic acid), amines, strong caustics [Note: Corrosive to iron, steel & other metals. Reacts with water to form acetic acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Conj, lac, corn edema, opac, photo; nasal, phar irrit; cough, dysp, bron; skin burns, vesic, sens derm TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Acetone</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CO	<b>CAS#:</b> 67-64-1	<b>RTECS#:</b> AL3150000	<b>IDLH:</b> 2500 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 2.38 mg/m <sup>3</sup>		<b>DOT:</b> 1090 127			
<b>Synonyms/Trade Names:</b> Dimethyl ketone, Ketone propane, 2-Propanone					
<b>Exposure Limits:</b> NIOSH REL: TWA 250 ppm (590 mg/m <sup>3</sup> ) OSHA PEL†: TWA 1000 ppm (2400 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1300, 2555, 3800 OSHA 69	
<b>Physical Description:</b> Colorless liquid with a fragrant, mint-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 58.1 BP: 133°F Sol: Miscible Fl.P: 0°F IP: 9.69 eV Sp.Gr: 0.79 VP: 180 mmHg FRZ: -140°F UEL: 12.8% LEL: 2.5% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>2500 ppm:</b> CcrOv*/PaprvOv*/GmFOv/Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; head, dizz, CNS depres; derm TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Acetone cyanohydrin</b>		<b>Formula:</b> CH <sub>3</sub> C(OH)CNCH <sub>3</sub>	<b>CAS#:</b> 75-86-5	<b>RTECS#:</b> OD9275000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.48 mg/m <sup>3</sup>		<b>DOT:</b> 1541 155 (stabilized)			
<b>Synonyms/Trade Names:</b> Cyanohydrin-2-propanone, 2-Cyano-2-propanol, α-Hydroxyisobutyronitrile, 2-Hydroxy-2-methyl-propionitrile, 2-Methylactonitrile					
<b>Exposure Limits:</b> NIOSH REL: C 1 ppm (4 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): NIOSH 2506	
<b>Physical Description:</b> Colorless liquid with a faint odor of bitter almond. [Note: Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> MW: 85.1 BP: 203°F Sol: Miscible Fl.P: 165°F IP: ? Sp.Gr(77°F): 0.93 VP: 0.8 mmHg FRZ: -4°F UEL: 12.0% LEL: 2.2% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 10 ppm: Sa 25 ppm: Sa:Cf 50 ppm: ScbaF/SaF 250 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Sulfuric acid, caustics [Note: Slowly decomposes to acetone & HCN at room temperatures; rate is accelerated by an increase in pH, water content, or temperature.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; dizz, lass, head, conf, convuls; liver, kidney inj; pulm edema, asphy TO: Eyes, skin, resp sys, CNS, CVS, liver, kidneys, GI tract			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Acetonitrile</b>		<b>Formula:</b> CH <sub>3</sub> CN	<b>CAS#:</b> 75-05-8	<b>RTECS#:</b> AL7700000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 1.68 mg/m <sup>3</sup>		<b>DOT:</b> 1648 127			
<b>Synonyms/Trade Names:</b> Cyanomethane, Ethyl nitrile, Methyl cyanide [Note: Forms cyanide in the body.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 20 ppm (34 mg/m <sup>3</sup> ) OSHA PEL†: TWA 40 ppm (70 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1606	
<b>Physical Description:</b> Colorless liquid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 41.1 BP: 179°F Sol: Miscible Fl.P(oc): 42°F IP: 12.20 eV Sp.Gr: 0.78 VP: 73 mmHg FRZ: -49°F UEL: 16.0% LEL: 3.0% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 200 ppm: CcrOv/Sa 500 ppm: Sa:Cf/PaprvOv/CcrFOv/GmFOv/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit nose, throat; asphy; nau, vomit; chest pain; lass; stupor, convuls; in animals: liver, kidney damage TO: Resp sys, CVS, CNS, liver, kidneys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>2-Acetylaminofluorene</b>	<b>Formula:</b> C <sub>15</sub> H <sub>13</sub> NO	<b>CAS#:</b> 53-96-3	<b>RTECS#:</b> AB9450000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> AAF, 2-AAF, 2-Acetaminofluorene, N-Acetyl-2-aminofluorene, FAA, 2-FAA, 2-Fluorenylacetamide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL:</b> [1910.1014] See Appendix B			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Tan, crystalline powder.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 223.3 <b>BP:</b> ? <b>Sol:</b> Insoluble <b>Fl.P:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> ? <b>VP:</b> ? <b>MLT:</b> 381°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> 100F/ScbaE  <b>See Appendix E (page 351)</b>	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Reduced function of liver, kidneys, bladder, pancreas; [carc] <b>TO:</b> Liver, bladder, kidneys, pancreas, skin [in animals: tumors of the liver, bladder, lungs, skin & pancreas]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Acetylene</b>	<b>Formula:</b> HC≡CH	<b>CAS#:</b> 74-86-2	<b>RTECS#:</b> AO9600000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 1.06 mg/m <sup>3</sup>	<b>DOT:</b> 1001 116			
<b>Synonyms/Trade Names:</b> Ethine, Ethyne [ <b>Note:</b> A compressed gas used in the welding & cutting of metals.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 2500 ppm (2662 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> Acetylene Criteria Document	
<b>Physical Description:</b> Colorless gas with a faint, ethereal odor. [ <b>Note:</b> Commercial grade has a garlic-like odor. Shipped under pressure dissolved in acetone.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 26.0 <b>BP:</b> Sublimes <b>Sol:</b> 2% <b>Fl.P:</b> NA (Gas) <b>IP:</b> 11.40 eV <b>RGasD:</b> 0.91 <b>VP:</b> 44.2 atm <b>FRZ:</b> -119°F (Sublimes) <b>UEL:</b> 100% <b>LEL:</b> 2.5% Flammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Zinc; oxygen & other oxidizing agents such as halogens [ <b>Note:</b> Forms explosive acetylide compounds with copper, mercury, silver & brasses (containing more than 66% copper).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Head, dizz; asphy; liquid: frostbite <b>TO:</b> CNS, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Fresh air	

<b>Acetylene tetrabromide</b>		<b>Formula:</b> CHBr <sub>2</sub> CHBr <sub>2</sub>	<b>CAS#:</b> 79-27-6	<b>RTECS#:</b> KI8225000	<b>IDLH:</b> 8 ppm
<b>Conversion:</b> 1 ppm = 14.14 mg/m <sup>3</sup>		<b>DOT:</b> 2504 159			
<b>Synonyms/Trade Names:</b> Symmetrical tetrabromoethane, TBE, Tetrabromoacetylene, Tetrabromoethane, 1,1,2,2-Tetrabromoethane					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL: TWA 1 ppm (14 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 2003	
<b>Physical Description:</b> Pale-yellow liquid with a pungent odor similar to camphor or iodoform. [Note: A solid below 32°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 345.7 BP: 474°F (Decomposes) Sol: 0.07% Fl.P: NA IP: ? Sp.Gr: 2.97 VP: 0.02 mmHg FRZ: 32°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> OSHA 8 ppmF: Sa/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong caustics; hot iron; reducing metals such as aluminum, magnesium, and zinc					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose; anor, nau; head; abdom pain; jaun; leucyt; CNS depres TO: Eyes, resp sys, liver, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

<b>Acetylsalicylic acid</b>		<b>Formula:</b> CH <sub>3</sub> COOC <sub>6</sub> H <sub>4</sub> COOH	<b>CAS#:</b> 50-78-2	<b>RTECS#:</b> VO0700000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> o-Acetoxybenzoic acid, 2-Acetoxybenzoic acid, Aspirin					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> NIOSH 0500	
<b>Physical Description:</b> Odorless, colorless to white, crystal-line powder. [aspirin] [Note: Develops the vinegar-like odor of acetic acid on contact with moisture.]					
<b>Chemical &amp; Physical Properties:</b> MW: 180.2 BP: 284°F (Decomposes) Sol(77°F): 0.3% Fl.P: NA IP: NA Sp.Gr: 1.35 VP: 0 mmHg (approx) MLT: 275°F UEL: NA LEL: NA MEC: 40 g/m <sup>3</sup> Combustible Powder; explosion hazard if dispersed in air.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: N.R. Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Solutions of alkali hydroxides or carbonates, strong oxidizers, moisture [Note: Slowly hydrolyzes in moist air to salicylic & acetic acids.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; incr blood clotting time; nau, vomit; liver, kidney inj TO: Eyes, skin, resp sys, blood, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Acrolein</b>	<b>Formula:</b> CH <sub>2</sub> =CHCHO	<b>CAS#:</b> 107-02-8	<b>RTECS#:</b> AS1050000	<b>IDLH:</b> 2 ppm
<b>Conversion:</b> 1 ppm = 2.29 mg/m <sup>3</sup>		<b>DOT:</b> 1092 131P (inhibited)		
<b>Synonyms/Trade Names:</b> Acraldehyde, Acrylaldehyde, Acrylic aldehyde, Allyl aldehyde, Propenal, 2-Propenal				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.25 mg/m <sup>3</sup> ) ST 0.3 ppm (0.8 mg/m <sup>3</sup> ) See Appendix C (Aldehydes) OSHA PEL†: TWA 0.1 ppm (0.25 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 2501 OSHA 52	
<b>Physical Description:</b> Colorless or yellow liquid with a piercing, disagreeable odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 56.1 BP: 127°F Sol: 40% Fl.P: -15°F IP: 10.13 eV Sp.Gr: 0.84 VP: 210 mmHg FRZ: -126°F UEL: 31% LEL: 2.8% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2 ppm:</b> Sa:Cf*/Pap/Ov*/CcrFOV/ GmFOV/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids, alkalis, ammonia, amines [Note: Polymerizes readily unless inhibited—usually with hydroquinone. May form shock-sensitive peroxides over time.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; decr pulm func; delayed pulm edema; chronic resp disease TO: Eyes, skin, resp sys, heart			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Acrylamide</b>	<b>Formula:</b> CH <sub>2</sub> =CHCONH <sub>2</sub>	<b>CAS#:</b> 79-06-1	<b>RTECS#:</b> AS3325000	<b>IDLH:</b> Ca [60 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b> 2074 153P		
<b>Synonyms/Trade Names:</b> Acrylamide monomer, Acrylic amide, Propenamide, 2-Propenamide				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.03 mg/m <sup>3</sup> [skin] See Appendix A OSHA PEL†: TWA 0.3 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): OSHA 21, PV2004	
<b>Physical Description:</b> White crystalline, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 71.1 BP: 347-572°F (Decomposes) Sol(86°F): 216% Fl.P: 280°F IP: 9.50 eV Sp.Gr: 1.12 VP: 0.007 mmHg MLT: 184°F UEL: ? LEL: ? Combustible Solid (may also be dissolved in flammable liquids).		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>¥:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: May polymerize violently upon melting.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; ataxia, numb limbs, pares; musc weak; absent deep tendon reflex; hand sweat; lass, drow; repro effects; [carc] TO: Eyes, skin, CNS, PNS, repro sys [in animals: tumors of the lungs, testes, thyroid & adrenal glands]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Acrylic acid</b>	<b>Formula:</b> CH <sub>2</sub> =CHCOOH	<b>CAS#:</b> 79-10-7	<b>RTECS#:</b> AS4375000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.95 mg/m <sup>3</sup>		<b>DOT:</b> 2218 132P (inhibited)		
<b>Synonyms/Trade Names:</b> Acroleic acid, Aqueous acrylic acid (technical grade is 94%), Ethylenecarboxylic acid, Glacial acrylic acid (98% in aqueous solution), 2-Propenoic acid				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (6 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>OSHA 28, PV2005</b>	
<b>Physical Description:</b> Colorless liquid or solid (below 55°F) with a distinctive, acid odor. [ <b>Note:</b> Shipped with an inhibitor (e.g., hydroquinone) since it readily polymerizes.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 72.1 <b>BP:</b> 286°F <b>Sol:</b> Miscible <b>Fl.P.:</b> 121°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.05 <b>VP:</b> 3 mmHg <b>FRZ:</b> 55°F <b>UEL:</b> 8.02% <b>LEL:</b> 2.4% Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
	<b>Incompatibilities and Reactivities:</b> Oxidizers, amines, alkalis, ammonium hydroxide, chloro-sulfonic acid, oleum, ethylene diamine, ethyleneimine, 2-aminoethanol [ <b>Note:</b> Corrosive to many metals.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; eye, skin burns; skin sens; in animals: lung, liver, kidney inj <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Acrylonitrile</b>	<b>Formula:</b> CH <sub>2</sub> =CHCN	<b>CAS#:</b> 107-13-1	<b>RTECS#:</b> AT5250000	<b>IDLH:</b> Ca [85 ppm]
<b>Conversion:</b> 1 ppm = 2.17 mg/m <sup>3</sup>		<b>DOT:</b> 1093 131P (inhibited)		
<b>Synonyms/Trade Names:</b> Acrylonitrile monomer, AN, Cyanoethylene, Propenenitrile, 2-Propenenitrile, VCN, Vinyl cyanide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 1 ppm C 10 ppm [15-minute] [skin] See Appendix A <b>OSHA PEL:</b> [1910.1045] TWA 2 ppm C 10 ppm [15-minute] [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 1604</b> <b>OSHA 37</b>	
<b>Physical Description:</b> Colorless to pale-yellow liquid with an unpleasant odor. [ <b>Note:</b> Odor can only be detected above the PEL.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 53.1 <b>BP:</b> 171°F <b>Sol:</b> 7% <b>Fl.P.:</b> 30°F <b>IP:</b> 10.91 eV <b>Sp.Gr:</b> 0.81 <b>VP:</b> 83 mmHg <b>FRZ:</b> -116°F <b>UEL:</b> 17% <b>LEL:</b> 3.0% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> * ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE  <b>See Appendix E</b> (page 351)	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids & alkalis; bromine; amines [ <b>Note:</b> Unless inhibited (usually with methylhydroquinone), may polymerize spontaneously or when heated or in presence of strong alkali. Attacks copper.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; asphy; head; sneez; nau, vomit; lass, dizz; skin vesic; scaling derm; [carc] <b>TO:</b> Eyes, skin, CVS, liver, kidneys, CNS [brain tumors, lung & bowel cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Adiponitrile</b>	<b>Formula:</b> NC(CH <sub>2</sub> ) <sub>4</sub> CN	<b>CAS#:</b> 111-69-3	<b>RTECS#:</b> AV2625000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.43 mg/m <sup>3</sup>	<b>DOT:</b> 2205 153			
<b>Synonyms/Trade Names:</b> 1,4-Dicyanobutane, Hexanedinitrile, Tetramethylene cyanide				
<b>Exposure Limits:</b> NIOSH REL: TWA 4 ppm (18 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> Nitriles Criteria Document	
<b>Physical Description:</b> Water-white, practically odorless, oily liquid. [ <b>Note:</b> A solid below 34°F. Forms cyanide in the body.]				
<b>Chemical &amp; Physical Properties:</b> MW: 108.2 BP: 563°F Sol: 4.5% Fl.P(oc): 199°F IP: ? Sp.Gr: 0.97 VP: 0.002 mmHg FRZ: 34°F UEL: 5.0% LEL: 1.7% Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>40 ppm:</b> Sa <b>100 ppm:</b> Sa:Cf <b>200 ppm:</b> ScbaF/SaF <b>250 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers (e.g., perchlorates, nitrates), strong acids (e.g., sulfuric acid) [ <b>Note:</b> Decomposes above 194°F, forming hydrogen cyanide.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz, lass, conf, convuls; blurred vision; dysp; abdom pain, nau, vomit TO: Eyes, skin, resp sys, CNS, CVS		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Aldrin</b>	<b>Formula:</b> C <sub>12</sub> H <sub>8</sub> Cl <sub>6</sub>	<b>CAS#:</b> 309-00-2	<b>RTECS#:</b> IO2100000	<b>IDLH:</b> Ca [25 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> HHDN, Octalene, 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-endo-1,4-exo-5,8-dimethanonaphthalene				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.25 mg/m <sup>3</sup> [skin] See Appendix A <b>OSHA PEL:</b> TWA 0.25 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5502	
<b>Physical Description:</b> Colorless to dark-brown crystalline solid with a mild chemical odor. [ <b>Note:</b> Formerly used as an insecticide.]				
<b>Chemical &amp; Physical Properties:</b> MW: 364.9 BP: Decomposes Sol: 0.003% Fl.P: NA IP: ? Sp.Gr: 1.60 VP: 0.00008 mmHg MLT: 219°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Concentrated mineral acids, active metals, acid catalysts, acid oxidizing agents, phenol				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Head, dizz; nau, vomit, mal; myoclonic jerks of limbs; clonic, tonic convuls; coma; hema, azotemia; [carc] TO: CNS, liver, kidneys, skin [in animals: tumors of the lungs, liver, thyroid & adrenal glands]		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

Allyl alcohol		Formula: CH <sub>2</sub> =CHCH <sub>2</sub> OH	CAS#: 107-18-6	RTECS#: BA5075000	IDLH: 20 ppm
<b>Conversion:</b> 1 ppm = 2.38 mg/m <sup>3</sup>		<b>DOT:</b> 1098 131			
<b>Synonyms/Trade Names:</b> AA, Allylic alcohol, Propenol, 1-Propen-3-ol, 2-Propenol, Vinyl carbinol					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (5 mg/m <sup>3</sup> ) ST 4 ppm (10 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 2 ppm (5 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 1402, 1405	
<b>Physical Description:</b> Colorless liquid with a pungent, mustard-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 58.1 BP: 205°F Sol: Miscible F.I.P: 70°F IP: 9.63 eV Sp.Gr: 0.85 VP: 17 mmHg FRZ: -200°F UEL: 18.0% LEL: 2.5% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 20 ppm: Sa:Cf*/PaprOv*/CcrFOv/ GmFOv/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp.AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, carbon tetrachloride [Note: Polymerization may be caused by elevated temperatures, oxidizers, or peroxides.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Eye irrit, tissue damage; irrit upper resp sys, skin; pulm edema TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

Allyl chloride		Formula: CH <sub>2</sub> =CHCH <sub>2</sub> Cl	CAS#: 107-05-1	RTECS#: UC7350000	IDLH: 250 ppm
<b>Conversion:</b> 1 ppm = 3.13 mg/m <sup>3</sup>		<b>DOT:</b> 1100 131			
<b>Synonyms/Trade Names:</b> 3-Chloropropene, 1-Chloro-2-propene, 3-Chloropropylene					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (3 mg/m <sup>3</sup> ) ST 2 ppm (6 mg/m <sup>3</sup> ) OSHA PEL†: TWA 1 ppm (3 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1000 OSHA 7	
<b>Physical Description:</b> Colorless, brown, yellow, or purple liquid with a pungent, unpleasant odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 76.5 BP: 113°F Sol: 0.4% F.I.P: -25°F IP: 10.05 eV Sp.Gr: 0.94 VP: 295 mmHg MLT: -210°F UEL: 11.1% LEL: 2.9% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 25 ppm: Sa:Cf* 50 ppm: ScbaF/SaF 250 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp.AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, amines, iron & aluminum chlorides, magnesium, zinc					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, muc memb; pulm edema; in animals: liver, kidney inj TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Allyl glycidyl ether</b>	<b>Formula:</b> C <sub>6</sub> H <sub>10</sub> O <sub>2</sub>	<b>CAS#:</b> 106-92-3	<b>RTECS#:</b> RR0875000	<b>IDLH:</b> 50 ppm
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>	<b>DOT:</b> 2219 129			
<b>Synonyms/Trade Names:</b> AGE, 1-Allyloxy-2,3-epoxypropane, Glycidyl allyl ether, [(2-Propenyloxy)methyl] oxirane				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (22 mg/m <sup>3</sup> ) [skin] ST 10 ppm (44 mg/m <sup>3</sup> ) OSHA PEL†: C 10 ppm (45 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 2545	
<b>Physical Description:</b> Colorless liquid with a pleasant odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 114.2 BP: 309°F Sol: 14% F.I.P: 135°F IP: ? Sp.Gr: 0.97 VP: 2 mmHg FRZ: -148°F [forms glass] UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 50 ppm: CcrOv/PapRov/ GmFOv/Sa/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, resp sys; derm; pulm edema; narco; possible hemato, repro effects TO: Eyes, skin, resp sys, blood, repro sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed	

<b>Allyl propyl disulfide</b>	<b>Formula:</b> H <sub>2</sub> C=CHCH <sub>2</sub> S <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 2179-59-1	<b>RTECS#:</b> JO0350000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.07 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4,5-Dithia-1-octene, Onion oil, 2-Propenyl propyl disulfide, Propyl allyl disulfide				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (12 mg/m <sup>3</sup> ) ST 3 ppm (18 mg/m <sup>3</sup> ) OSHA PEL†: TWA 2 ppm (12 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): OSHA PV2086	
<b>Physical Description:</b> Pale-yellow liquid with a strong & irritating onion-like odor. [Note: The chief volatile component of onion oil.]				
<b>Chemical &amp; Physical Properties:</b> MW: 148.3 BP: ? Sol: Insoluble F.I.P: ? IP: ? Sp.Gr(59°F): 0.93 VP: ? FRZ: 5°F UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, resp sys; lac TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b><math>\alpha</math>-Alumina</b>	<b>Formula:</b> Al <sub>2</sub> O <sub>3</sub>	<b>CAS#:</b> 1344-28-1	<b>RTECS#:</b> BD1200000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Alumina, Aluminum oxide, Aluminum trioxide [Note: $\alpha$ -Alumina is the main component of technical grade alumina. Corundum is natural Al <sub>2</sub> O <sub>3</sub> . Emery is an impure crystalline variety of Al <sub>2</sub> O <sub>3</sub> .]				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600 OSHA ID109SG, ID198SG	
<b>Physical Description:</b> White, odorless, crystalline powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 101.9 BP: 5396°F Sol: Insoluble F.P: NA IP: NA Sp.Gr: 4.0 VP: 0 mmHg (approx) MLT: 3632°F UEL: NA LEL: NA Noncombustible solid, but dusts may form explosive mixtures in air.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Chlorine trifluoride, hot chlorinated rubber, acids, oxidizers [Note: Hydrogen gas may be formed when finely divided iron contacts moisture during crushing & milling operations.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Blot/brush away Breath: Fresh air Swallow: Medical attention immed	

<b>Aluminum</b>	<b>Formula:</b> Al	<b>CAS#:</b> 7429-90-5	<b>RTECS#:</b> BD0330000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 1309 170 (powder, coated); 1396 138 (powder, uncoated); 9260 169 (molten)			
<b>Synonyms/Trade Names:</b> Aluminium, Aluminum metal, Aluminum powder, Elemental aluminum				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 7013, 7300, 7301, 7303 OSHA ID121	
<b>Physical Description:</b> Silvery-white, malleable, ductile, odorless metal.				
<b>Chemical &amp; Physical Properties:</b> MW: 27.0 BP: 4221°F Sol: Insoluble F.P: NA IP: NA Sp.Gr: 2.70 VP: 0 mmHg (approx) MLT: 1220°F UEL: NA LEL: NA Combustible Solid, finely divided dust is easily ignited; may cause explosions.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong oxidizers & acids, halogenated hydrocarbons [Note: Corrodes in contact with acids & other metals. Ignition may occur if powders are mixed with halogens, carbon disulfide, or methyl chloride.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Irrit eyes, skin, resp sys TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Breath: Fresh air	

<b>Aluminum (pyro powders and welding fumes, as Al)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1383 135 (powder, pyrophoric)			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific aluminum compound.					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific aluminum compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific aluminum compound.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit skin, resp sys; pulm fib TO: Skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Aluminum (soluble salts and alkyls, as Al)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 3051 135 (Aluminum alkyls)			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific aluminum compound.					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> NIOSH 7013, 7300, 7301, 7303 OSHA ID121	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific aluminum compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific aluminum compound.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit skin, resp sys; skin burns TO: Skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>4-Aminodiphenyl</b>		<b>Formula:</b> C <sub>8</sub> H <sub>9</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub>	<b>CAS#:</b> 92-67-1	<b>RTECS#:</b> DU8925000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4-Aminobiphenyl, p-Aminobiphenyl, p-Aminodiphenyl, 4-Phenylaniline					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL:</b> [1910.1011] See Appendix B				<b>Measurement Methods (see Table 1):</b> <b>NIOSH P&amp;CAM269 (II-4)</b> <b>OSHA 93</b>	
<b>Physical Description:</b> Colorless crystals with a floral odor. [ <b>Note:</b> Turns purple on contact with air.]					
<b>Chemical &amp; Physical Properties:</b> MW: 169.2 BP: 576°F Sol: Slight FI.P: ? IP: ? Sp.Gr: 1.16 VP(227°F): 1 mmHg MLT: 127°F UEL: ? LEL: ? Combustible Solid, but must be preheated before ignition possible.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE  <b>See Appendix E (page 351)</b>	
<b>Incompatibilities and Reactivities:</b> Oxidized by air					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Head, dizz; drow, dysp; ataxia, lass; methemo; urinary burning; acute hemorrhagic cystitis; [carc] <b>TO:</b> Bladder, skin [bladder cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2-Aminopyridine</b>		<b>Formula:</b> NH <sub>2</sub> C <sub>5</sub> H <sub>4</sub> N	<b>CAS#:</b> 504-29-0	<b>RTECS#:</b> US1575000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 3.85 mg/m <sup>3</sup>		<b>DOT:</b> 2671 153			
<b>Synonyms/Trade Names:</b> α-Aminopyridine, α-Pyridylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 ppm (2 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 0.5 ppm (2 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH S158 (II-4)</b>	
<b>Physical Description:</b> White powder, leaflets, or crystals with a characteristic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 94.1 BP: 411°F Sol: >100% FI.P: 154°F IP: 8.00 eV Sp.Gr: ? VP(77°F): 0.8 mmHg MLT: 137°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>5 ppm:</b> Sa*/ScbaF ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; head, dizz; excitement; nau; high BP; resp distress; lass; convuls; stupor <b>TO:</b> CNS, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Amitrole</b>	<b>Formula:</b> C <sub>2</sub> H <sub>4</sub> N <sub>4</sub>	<b>CAS#:</b> 61-82-5	<b>RTECS#:</b> XZ3850000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Aminotriazole; 3-Aminotriazole; 2-Amino-1,3,4-triazole; 3-Amino-1,2,4-triazole				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.2 mg/m <sup>3</sup> See Appendix A		<b>OSHA PEL†:</b> none		<b>Measurement Methods</b> (see Table 1): NIOSH 0500 OSHA PV2006
<b>Physical Description:</b> Colorless to white, crystalline powder. [herbicide] [Note: Odorless when pure.]				
<b>Chemical &amp; Physical Properties:</b> MW: 84.1 BP: ? Sol(77°F): 28% Fl.P: NA IP: ? Sp.Gr: 1.14 VP: <0.000008 mmHg MLT: 318°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☞: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE
<b>Incompatibilities and Reactivities:</b> Light (decomposes), strong oxidizers [Note: Corrosive to iron, aluminum & copper.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; dysp, musc spasms, ataxia, anor, salv, incr body temperature; lass, skin dryness, depres (thyroid func suppression) TO: Eyes, skin, thyroid [in animals: liver, thyroid & pituitary gland tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Ammonia</b>	<b>Formula:</b> NH <sub>3</sub>	<b>CAS#:</b> 7664-41-7	<b>RTECS#:</b> BO0875000	<b>IDLH:</b> 300 ppm
<b>Conversion:</b> 1 ppm = 0.70 mg/m <sup>3</sup>	<b>DOT:</b> 1005 125 (anhydrous); 2672 154 (10-35% solution); 2073 125 (>35-50% solution); 1005 125 (>50% solution)			
<b>Synonyms/Trade Names:</b> Anhydrous ammonia, Aqua ammonia, Aqueous ammonia [Note: Often used in an aqueous solution.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (18 mg/m <sup>3</sup> ) ST 35 ppm (27 mg/m <sup>3</sup> )		<b>OSHA PEL†:</b> TWA 50 ppm (35 mg/m <sup>3</sup> )		<b>Measurement Methods</b> (see Table 1): NIOSH 3800, 6015, 6016 OSHA ID188
<b>Physical Description:</b> Colorless gas with a pungent, suffocating odor. [Note: Shipped as a liquefied compressed gas. Easily liquefied under pressure.]				
<b>Chemical &amp; Physical Properties:</b> MW: 17.0 BP: -28°F Sol: 34% Fl.P: NA (Gas) IP: 10.18 eV RGasD: 0.60 VP: 8.5 atm FRZ: -108°F UEL: 28% LEL: 15% [Note: Although NH <sub>3</sub> does not meet the DOT definition of a Flammable Gas (for labeling purposes), it should be treated as one.]		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam (solution) <b>Remove:</b> When wet or contam (solution) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>10%) Quick drench (>10%)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>250 ppm:</b> CcrS*/Sa* <b>300 ppm:</b> Sa:C*/PaprS*/CcrF/ GmFS/ScbaF/SaF ☞: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, halogens, salts of silver & zinc [Note: Corrosive to copper & galvanized surfaces.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing (solution), Con (solution/liquid) SY: Irrit eyes, nose, throat; dysp, wheez, chest pain; pulm edema; pink frothy sputum; skin burns, vesic; liquid: frostbite TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (solution/liquid) <b>Skin:</b> Water flush immed (solution/liquid) <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (solution)	

<b>Ammonium chloride fume</b>		<b>Formula:</b> NH <sub>4</sub> Cl	<b>CAS#:</b> 12125-02-9	<b>RTECS#:</b> BP4550000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Ammonium chloride, Ammonium muriate fume, Sal ammoniac fume					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> ST 20 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA ID188	
<b>Physical Description:</b> Finely divided, odorless, white particulate dispersed in air.					
<b>Chemical &amp; Physical Properties:</b> MW: 53.5 BP: Sublimes Sol: 37% F.I.P: NA IP: NA Sp.Gr: 1.53 VP(321°F): 1 mmHg MLT: 662°F (Sublimes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis & their carbonates, lead & silver salts, strong oxidizers, ammonium nitrate, potassium chlorate, bromine trifluoride [ <b>Note:</b> Corrodes most metals at high (i.e., fire) temperatures.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; cough, dysp, pulm sens TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support		

<b>Ammonium sulfamate</b>		<b>Formula:</b> NH <sub>4</sub> OSO <sub>2</sub> NH <sub>2</sub>	<b>CAS#:</b> 7773-06-0	<b>RTECS#:</b> WO6125000	<b>IDLH:</b> 1500 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Ammate herbicide, Ammonium amidosulfonate, AMS, Monoammonium salt of sulfamic acid, Sulfamate					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods</b> (see Table 1): NIOSH S348 (II-5)	
<b>Physical Description:</b> Colorless to white crystalline, odorless solid. [herbicide]					
<b>Chemical &amp; Physical Properties:</b> MW: 114.1 BP: 320°F (Decomposes) Sol: 200% F.I.P: NA IP: ? Sp.Gr: 1.77 VP: 0 mmHg (approx) MLT: 268°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> 50 mg/m <sup>3</sup> : Qm 100 mg/m <sup>3</sup> : 95XQ/Sa 250 mg/m <sup>3</sup> : Sa:Cf/PaprHie 500 mg/m <sup>3</sup> : SaT:Cf/PaprTHie/100F/ ScbaF/SaF 1500 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Acids, hot water [ <b>Note:</b> Elevated temperatures cause a highly exothermic reaction with water.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, throat; cough, dysp TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>n-Amyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COO(CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 628-63-7	<b>RTECS#:</b> AJ9250000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>		<b>DOT:</b> 1104 129			
<b>Synonyms/Trade Names:</b> Amyl acetic ester, Amyl acetic ether, 1-Pentanol acetate, Pentyl ester of acetic acid, Primary amyl acetate					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (525 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (525 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1450, 2549 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a persistent banana-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 130.2 BP: 301°F Sol: 0.2% Fl.P: 77°F IP: ? Sp.Gr: 0.88 VP: 4 mmHg FRZ: -95°F UEL: 7.5% LEL: 1.1% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> CcrOv*/GmFOv/PaprvOv/ Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose; dermat; possible CNS depres, narco TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>sec-Amyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOCH(CH <sub>3</sub> )C <sub>3</sub> H <sub>7</sub>	<b>CAS#:</b> 626-38-0	<b>RTECS#:</b> AJ2100000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>		<b>DOT:</b> 1104 129			
<b>Synonyms/Trade Names:</b> 1-Methylbutyl acetate, 2-Pentanol acetate, 2-Pentyl ester of acetic acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 125 ppm (650 mg/m <sup>3</sup> ) OSHA PEL: TWA 125 ppm (650 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1450, 2549 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a mild odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 130.2 BP: 249°F Sol: Slight Fl.P: 89°F IP: ? Sp.Gr: 0.87 VP: 7 mmHg FRZ: -109°F UEL: 7.5% LEL: 1% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> CcrOv*/GmFOv/PaprvOv/ Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; narco; dermat; possible kidney, liver inj; possible CNS depres TO: Eyes, skin, resp sys, kidneys, liver, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Aniline (and homologs)</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub>	<b>CAS#:</b> 62-53-3	<b>RTECS#:</b> BW6650000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 3.81 mg/m <sup>3</sup>		<b>DOT:</b> 1547 153			
<b>Synonyms/Trade Names:</b> Aminobenzene, Aniline oil, Benzenamine, Phenylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL†:</b> TWA 5 ppm (19 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 2002, 2017, 8317 <b>OSHA</b> PV2079		
<b>Physical Description:</b> Colorless to brown, oily liquid with an aromatic amine-like odor. [ <b>Note:</b> A solid below 21°F.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 93.1 <b>BP:</b> 363°F <b>Sol:</b> 4% <b>Fl.P:</b> 158°F <b>IP:</b> 7.70 eV <b>Sp.Gr:</b> 1.02 <b>VP:</b> 0.6 mmHg <b>FRZ:</b> 21°F <b>UEL:</b> 11% <b>LEL:</b> 1.3% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, toluene diisocyanate, alkalis					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Head, lass, dizz; cyan; ataxia; dysp on effort; tacar; irrit eyes; methemo; cirr; [carc] <b>TO:</b> Blood, CVS, eyes, liver, kidneys, resp sys [bladder cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Anisidine</b>		<b>Formula:</b> NH <sub>2</sub> C <sub>6</sub> H <sub>4</sub> OCH <sub>3</sub>	<b>CAS#:</b> 90-04-0	<b>RTECS#:</b> BZ5410000	<b>IDLH:</b> Ca [50 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b> 2431 153			
<b>Synonyms/Trade Names:</b> ortho-Aminoanisole, 2-Anisidine, o-Methoxyaniline [ <b>Note:</b> o-Anisidine has been used as a basis for many dyes.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca 0.5 mg/m <sup>3</sup> [skin] See Appendix A <b>OSHA PEL:</b> TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 2514		
<b>Physical Description:</b> Red or yellow, oily liquid with an amine-like odor. [ <b>Note:</b> A solid below 41°F.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 123.2 <b>BP:</b> 437°F <b>Sol(77°F):</b> 1% <b>Fl.P(oc):</b> 244°F <b>IP:</b> 7.44 eV <b>Sp.Gr:</b> 1.10 <b>VP:</b> <0.1 mmHg <b>FRZ:</b> 41°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Head, dizz; cyan; RBC Heinz bodies; [carc] <b>TO:</b> Blood, kidneys, liver, CVS, CNS [in animals: tumors of the thyroid gland, bladder & kidneys]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>p-Anisidine</b>	<b>Formula:</b> NH <sub>2</sub> C <sub>6</sub> H <sub>4</sub> OCH <sub>3</sub>	<b>CAS#:</b> 104-94-9	<b>RTECS#:</b> BZ5450000	<b>IDLH:</b> 50 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2431 153			
<b>Synonyms/Trade Names:</b> para-Aminoanisole, 4-Anisidine, p-Methoxyaniline				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2514	
<b>Physical Description:</b> Yellow to brown, crystalline solid with an amine-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 123.2 BP: 475°F Sol: Moderate Fl.P: ? IP: 7.44 eV Sp.Gr: 1.07 VP(77°F): 0.006 mmHg MLT: 135°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 5 mg/m <sup>3</sup> : 95XQ/Sa 12.5 mg/m <sup>3</sup> : Sa:Cf/PaprHie 25 mg/m <sup>3</sup> : 100F/PaprTHie*/ScbaF/SaF 50 mg/m <sup>3</sup> : Sa:Pd,Pp* §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, dizz; cyan; RBC Heinz bodies TO: Blood, kidneys, liver, CVS, CNS		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Antimony</b>	<b>Formula:</b> Sb	<b>CAS#:</b> 7440-36-0	<b>RTECS#:</b> CC4025000	<b>IDLH:</b> 50 mg/m <sup>3</sup> (as Sb)
<b>Conversion:</b>	<b>DOT:</b> 1549 157 (inorganic compounds, n.o.s.); 2871 170 (powder); 3141 157 (inorganic liquid compounds, n.o.s.)			
<b>Synonyms/Trade Names:</b> Antimony metal, Antimony powder, Stibium				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.5 mg/m <sup>3</sup> OSHA PEL*: TWA 0.5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other antimony compounds (as Sb).]			<b>Measurement Methods</b> (see Table 1): NIOSH 7301, 7303, P&CAM 261 (II-4) OSHA ID121, ID125G, ID206	
<b>Physical Description:</b> Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 121.8 BP: 2975°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 6.69 VP: 0 mmHg (approx) MLT: 1166°F UEL: NA LEL: NA	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 5 mg/m <sup>3</sup> : 95XQ/Sa 12.5 mg/m <sup>3</sup> : Sa:Cf/PapHie 25 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ScbaF/SaF 50 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.				
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, mouth; cough; dizz; head; nau, vomit, diarr; stomach cramps; insom; anor; unable to smell properly TO: Eyes, skin, resp sys, CVS		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>ANTU</b>		<b>Formula:</b> C <sub>10</sub> H <sub>7</sub> NHC(NH <sub>2</sub> )S	<b>CAS#:</b> 86-88-4	<b>RTECS#:</b> YT9275000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1651 153			
<b>Synonyms/Trade Names:</b> α-Naphthyl thiocarbamide, 1-Naphthyl thiourea, α-Naphthyl thiourea					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.3 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 0.3 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> <b>NIOSH S276 (II-5)</b>	
<b>Physical Description:</b> White crystalline or gray, odorless powder. [rodenticide]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 202.3 <b>BP:</b> Decomposes <b>Sol:</b> 0.06% <b>F.I.P:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> ? <b>VP:</b> Low <b>MLT:</b> 388°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>3 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>7.5 mg/m<sup>3</sup>:</b> Sa:Cf/PapRovHie <b>15 mg/m<sup>3</sup>:</b> CcrFOv100/GmFOv100/ PapRTOvHie/SaT:Cf/ScbaF/SaF <b>100 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, silver nitrate					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing <b>SY:</b> After ingestion of large doses: vomit, dysp, cyan, coarse pulm rales; liver damage <b>TO:</b> Resp sys, blood, liver				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Arsenic (inorganic compounds, as As)</b>		<b>Formula:</b> As (metal)	<b>CAS#:</b> 7440-38-2 (metal)	<b>RTECS#:</b> CG0525000 (metal)	<b>IDLH:</b> Ca [5 mg/m <sup>3</sup> (as As)]
<b>Conversion:</b>		<b>DOT:</b> 1558 152 (metal); 1562 152 (dust)			
<b>Synonyms/Trade Names:</b> Arsenia Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite & all inorganic compounds containing arsenic except ARSINE.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca C 0.002 mg/m <sup>3</sup> [15-minute] See Appendix A <b>OSHA PEL:</b> [1910.1018] TWA 0.010 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7300, 7301, 7303, 9102, 7900 <b>OSHA</b> ID105	
<b>Physical Description:</b> Metal: Silver-gray or tin-white, brittle, odorless solid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 74.9 <b>BP:</b> Sublimes <b>Sol:</b> Insoluble <b>F.I.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 5.73 (metal) <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 1135°F (Sublimes) <b>UEL:</b> NA <b>LEL:</b> NA		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ✕: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFAg100/ScbaE  <b>See Appendix E (page 351)</b>	
Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.					
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Con, Ing <b>SY:</b> Ulceration of nasal septum, derm, GI disturbances, peri neur, resp irrit, hyperpig of skin, [carc] <b>TO:</b> Liver, kidneys, skin, lungs, lymphatic sys [lung & lymphatic cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Arsenic (organic compounds, as As)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b>
					N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific organic arsenic compound.					
<b>Exposure Limits:</b> NIOSH REL: none OSHA PEL: TWA 0.5 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): NIOSH 5022	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific organic arsenic compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific organic arsenic compound.		<b>Personal Protection/Sanitation</b> (see Table 2): Recommendations regarding personal protective clothing vary depending upon the specific compound.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit skin, possible derm; resp distress; diarr; kidney damage; musc tremor, convuls; possible GI tract, repro effects; possible liver damage TO: Skin, resp sys, kidneys, CNS, liver, GI tract, repro sys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Arsine</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b>
		AsH <sub>3</sub>	7784-42-1	CG6475000	Ca [3 ppm]
<b>Conversion:</b> 1 ppm = 3.19 mg/m <sup>3</sup>		<b>DOT:</b> 2188 119			
<b>Synonyms/Trade Names:</b> Arsenic hydride, Arsenic trihydride, Arseniuretted hydrogen, Arsenous hydride, Hydrogen arsenide					
<b>Exposure Limits:</b> NIOSH REL: Ca C 0.002 mg/m <sup>3</sup> [15-minute] See Appendix A OSHA PEL: TWA 0.05 ppm (0.2 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 6001 OSHA ID105	
<b>Physical Description:</b> Colorless gas with a mild, garlic-like odor. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 78.0 BP: -81°F Sol: 20% F.L.P: NA (Gas) IP: 9.89 eV RGasD: 2.69 VP(70°F): 14.9 atm FRZ: -179°F UEL: 78% LEL: 5.1% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞ ScbaF: Pd, Pp/SaF: Pd, Pp/AScBa Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chlorine, nitric acid [Note: Decomposes above 446°F. There is a high potential for the generation of arsine gas when inorganic arsenic is exposed to nascent (freshly formed) hydrogen.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Head, mal, lass, dizz; dysp; abdom, back pain; nau, vomit; bronze skin; hema; jaun; peri neur; liquid: frostbite; [carc] TO: Blood, kidneys, liver [lung & lymphatic cancer]				<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

## A

<b>Asbestos</b>	<b>Formula:</b> Hydrated mineral silicates	<b>CAS#:</b> 1332-21-4	<b>RTECS#:</b> Cl6475000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b> 2212 171 (blue, brown); 2590 171 (white)			
<b>Synonyms/Trade Names:</b> Actinolite, Actinolite asbestos, Amosite (cummingtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite), Tremolite, Tremolite asbestos				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A See Appendix C <b>OSHA PEL:</b> [1910.1001] [1926.1101] See Appendix C			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7400, 7402 <b>OSHA</b> ID160, ID191	
<b>Physical Description:</b> White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite) fibrous, odorless solids.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> Varies <b>BP:</b> Decomposes <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr.?</b> <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 1112°F (Decomposes) <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solids	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE  <b>See Appendix E</b> (page 351)		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Asbestosis (chronic exposure): dysp, interstitial fib, restricted pulm function, finger clubbing; irrit eyes; [carc] <b>TO:</b> Resp sys, eyes [lung cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Asphalt fumes</b>	<b>Formula:</b>	<b>CAS#:</b> 8052-42-4	<b>RTECS#:</b> Cl9900000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b> 1999 130 (asphalt)			
<b>Synonyms/Trade Names:</b> <b>Asphalt:</b> Asphaltum, Bitumen (European term), Petroleum asphalt, Petroleum bitumen, Road asphalt, Roofing asphalt				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca C 5 mg/m <sup>3</sup> [15-minute] See Appendix A <b>OSHA PEL:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 5042	
<b>Physical Description:</b> Fumes generated during the production or application of asphalt (a dark-brown to black cement-like substance manufactured by the vacuum distillation of crude petroleum oil).				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific asphalt formulation or mixture.  Asphalt: Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV100/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported [ <b>Note:</b> Asphalt becomes molten at about 200°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Con <b>SY:</b> Irrit eyes, resp sys; [carc] <b>TO:</b> Eyes, resp sys [in animals: skin tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Resp support	

<b>Atrazine</b>	<b>Formula:</b> C <sub>8</sub> H <sub>14</sub> ClN <sub>5</sub>	<b>CAS#:</b> 1912-24-9	<b>RTECS#:</b> XY5600000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2763 151 (triazine pesticide)			
<b>Synonyms/Trade Names:</b> 2-Chloro-4-ethylamino-6-isopropylamino-s-triazine; 6-Chloro-N-ethyl-N'-(1-methylethyl)-1,3,5-triazine-2,4-diamine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> <b>(see Table 1):</b> <b>NIOSH</b> 5602, 8315	
<b>Physical Description:</b> Colorless or white, odorless, crystalline powder. [herbicide]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 215.7 <b>BP:</b> Decomposes <b>Sol:</b> 0.003% <b>F.I.P.:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 1.19 <b>VP:</b> 0.0000003 mmHg <b>MLT:</b> 340°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but may be mixed with flammable liquids.		<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> Strong acids, strong bases				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin; derm, sens skin; dysp, lass, inco, salv; hypothermia; liver inj <b>TO:</b> Eyes, skin, resp sys, CNS, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Azinphos-methyl</b>	<b>Formula:</b> C <sub>10</sub> H <sub>12</sub> O <sub>3</sub> PS <sub>2</sub> N <sub>3</sub> [(CH <sub>3</sub> O) <sub>2</sub> P(S)SCH <sub>2</sub> (N <sub>2</sub> C <sub>7</sub> H <sub>4</sub> O)]	<b>CAS#:</b> 86-50-0	<b>RTECS#:</b> TE1925000	<b>IDLH:</b> 10 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2783 152 (organophosphorus pesticide, solid, toxic)			
<b>Synonyms/Trade Names:</b> O,O-Dimethyl-S 4-oxo-1,2,3-benzotriazin-3(4H)-ylmethyl phosphorodithioate; Guthion®; Methyl azinphos				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.2 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.2 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> <b>(see Table 1):</b> <b>NIOSH</b> 5600 <b>OSHA</b> PV2087	
<b>Physical Description:</b> Colorless crystals or a brown, waxy solid. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 317.3 <b>BP:</b> Decomposes <b>Sol:</b> 0.003% <b>F.I.P.:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 1.44 <b>VP:</b> 8 x 10 <sup>-9</sup> mmHg <b>MLT:</b> 163°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>5 mg/m<sup>3</sup>:</b> Sa:Cf/Pap/OvHie <b>10 mg/m<sup>3</sup>:</b> CcrFOv100/GmFOv100/ Pap/TovHie/SaT:Cf/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:Ascba <b>Escape:</b> GmFOv100/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Miosis; ache eyes; blurred vision, lac, rhin; head; chest tight, wheez, lar spasm; salv; cyan; anor; nau, vomit, diarr; sweat; twitch, para, convuls; low BP, card irreg <b>TO:</b> Resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

## B

<b>Barium chloride (as Ba)</b>	<b>Formula:</b> BaCl <sub>2</sub>	<b>CAS#:</b> 10361-37-2	<b>RTECS#:</b> CQ8750000	<b>IDLH:</b> 50 mg/m <sup>3</sup> (as Ba)
<b>Conversion:</b>	<b>DOT:</b> 1564 154 (barium compound, n.o.s.)			
<b>Synonyms/Trade Names:</b> Barium dichloride				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.5 mg/m <sup>3</sup> OSHA PEL*: TWA 0.5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other soluble barium compounds (as Ba) except Barium sulfate.]			<b>Measurement Methods (see Table 1):</b> NIOSH 7056, 7303 OSHA ID121	
<b>Physical Description:</b> White, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 208.2 BP: 2840°F Sol: 38% Fl.P: NA IP: ? Sp.Gr: 3.86 VP: Low MLT: 1765°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>12.5 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>25 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprThie/ ScbaF/SaF <b>50 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Acids, oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; skin burns; gastroenteritis; musc spasm; slow pulse, extrasystoles; hypokalemia <b>TO:</b> Eyes, skin, resp sys, heart, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Barium nitrate (as Ba)</b>	<b>Formula:</b> Ba(NO <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 10022-31-8	<b>RTECS#:</b> CQ9625000	<b>IDLH:</b> 50 mg/m <sup>3</sup> (as Ba)
<b>Conversion:</b>	<b>DOT:</b> 1446 141			
<b>Synonyms/Trade Names:</b> Barium dinitrate, Barium(II) nitrate (1:2), Barium salt of nitric acid				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.5 mg/m <sup>3</sup> OSHA PEL*: TWA 0.5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other soluble barium compounds (as Ba) except Barium sulfate.]			<b>Measurement Methods (see Table 1):</b> NIOSH 7056 OSHA ID121	
<b>Physical Description:</b> White, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 261.4 BP: Decomposes Sol: 9% Fl.P: NA IP: ? Sp.Gr: 3.24 VP: Low MLT: 1094°F UEL: NA LEL: NA Noncombustible Solid, but will accelerate the burning of combustible materials.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>12.5 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>25 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprThie/ ScbaF/SaF <b>50 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Acids, oxidizers, aluminum-magnesium alloys. (barium dioxide + zinc) [*Note: Contact with combustible material may cause fire.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; skin burns; gastroenteritis; musc spasm; slow pulse, extrasystoles; hypokalemia <b>TO:</b> Eyes, skin, resp sys, heart, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Barium sulfate</b>	<b>Formula:</b> BaSO <sub>4</sub>	<b>CAS#:</b> 7727-43-7	<b>RTECS#:</b> CR0600000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 1564 154 (barium compound, n.o.s.)			
<b>Synonyms/Trade Names:</b> Artificial barite, Barite, Barium salt of sulfuric acid, Barytes (natural)				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> White or yellowish, odorless powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 233.4 BP: 2912°F (Decomposes) Sol(64°F): 0.0002% Fl.P: NA IP: NA Sp.Gr: 4.25-4.5 VP: 0 mmHg (approx) MLT: 2876°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Phosphorus, aluminum [Note: Aluminum in the presence of heat can cause an explosion.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, upper resp sys; benign pneumoconiosis (baritosis) TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

B

<b>Benomyl</b>	<b>Formula:</b> C <sub>14</sub> H <sub>18</sub> N <sub>4</sub> O <sub>3</sub>	<b>CAS#:</b> 17804-35-2	<b>RTECS#:</b> DD6475000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2757 151 (carbamate pesticide, solid)			
<b>Synonyms/Trade Names:</b> Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600 OSHA PV2107	
<b>Physical Description:</b> White crystalline solid with a faint, acrid odor. [fungicide] [Note: Decomposes without melting above 572°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 290.4 BP: Decomposes Sol: 0.0004% Fl.P: NA IP: NA Sp.Gr: ? VP: <0.00001 mmHg MLT: >572°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Heat, strong acids, strong alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; skin sens; possible repro, terato effects TO: Eyes, skin, resp sys, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

B

<b>Benzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>6</sub>	<b>CAS#:</b> 71-43-2	<b>RTECS#:</b> CY1400000	<b>IDLH:</b> Ca [500 ppm]
<b>Conversion:</b> 1 ppm = 3.19 mg/m <sup>3</sup>		<b>DOT:</b> 1114 130			
<b>Synonyms/Trade Names:</b> Benzol, Phenyl hydride					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A			<b>OSHA PEL:</b> [1910.1028] TWA 1 ppm ST 5 ppm See Appendix F		<b>Measurement Methods (see Table 1):</b> NIOSH 1500, 1501, 3700, 3800 OSHA 12, 1005
<b>Physical Description:</b> Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 78.1 BP: 176°F Sol: 0.07% Fl.P: 12°F IP: 9.24 eV Sp.Gr: 0.88 VP: 75 mmHg FRZ: 42°F UEL: 7.8% LEL: 1.2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, many fluorides & perchlorates, nitric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, resp sys; dizz; head, nau, staggered gait; anor, lass; derm; bone marrow depres; [carc] TO: Eyes, skin, resp sys, blood, CNS, bone marrow [leukemia]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Benzenethiol</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> SH	<b>CAS#:</b> 108-98-5	<b>RTECS#:</b> DC0525000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.51 mg/m <sup>3</sup>		<b>DOT:</b> 2337 131			
<b>Synonyms/Trade Names:</b> Mercaptobenzene, Phenyl mercaptan, Thiophenol					
<b>Exposure Limits:</b> NIOSH REL: C 0.1 ppm (0.5 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> OSHA PV2075		
<b>Physical Description:</b> Water-white liquid with an offensive, garlic-like odor. [Note: A solid below 5°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 110.2 BP: 336°F Sol(77°F): 0.08% Fl.P: 132°F IP: 8.33 eV Sp.Gr: 1.08 VP(65°F): 1 mmHg FRZ: 5°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 1 ppm: CcrOv/Sa 2.5 ppm: Sa:Cf/PapOv 5 ppm: CcrFOv/GmFOv/PapTOv/ ScbaF/SaF ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids & bases, calcium hypochlorite, alkali metals [Note: Oxidizes on exposure to air.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; derm; cyan; cough, wheez, dysp, pulm edema, pneu; head, dizz, CNS depres; nau, vomit; kidney, liver, spleen damage TO: Eyes, skin, resp sys, CNS, kidneys, liver, spleen			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Benzidine</b>	<b>Formula:</b> NH <sub>2</sub> C <sub>6</sub> H <sub>4</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub>	<b>CAS#:</b> 92-87-5	<b>RTECS#:</b> DC9625000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b> 1885 153			
<b>Synonyms/Trade Names:</b> Benzidine-based dyes; 4,4'-Bianiline; 4,4'-Biphenyldiamine; 1,1'-Biphenyl-4,4'-diamine; 4,4'-Diaminobiphenyl; p-Diaminodiphenyl [Note: Benzidine has been used as a basis for many dyes.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A See Appendix C			<b>OSHA PEL:</b> [1910.1010] See Appendix B See Appendix C	
<b>Physical Description:</b> Grayish-yellow, reddish-gray, or white crystalline powder. [Note: Darkens on exposure to air and light.]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5509 <b>OSHA</b> 65	
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 184.3 <b>BP:</b> 752°F <b>Sol(54°F):</b> 0.04% <b>Fl.P.:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> 1.25 <b>VP:</b> Low <b>MLT:</b> 239°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid, but difficult to burn.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> 100F/ScbaE  <b>See Appendix E</b> (page 351)
<b>Incompatibilities and Reactivities:</b> Red fuming nitric acid				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Hema; secondary anemia from hemolysis; acute cystitis; acute liver disorders; derm; painful, irreg urination; [carc] <b>TO:</b> Bladder, skin, kidneys, liver, blood [liver, kidney & bladder cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

B

<b>Benzoyl peroxide</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>5</sub> CO) <sub>2</sub> O <sub>2</sub>	<b>CAS#:</b> 94-36-0	<b>RTECS#:</b> DM8575000	<b>IDLH:</b> 1500 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Benzoperoxide, Dibenzoyl peroxide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5009	
<b>Physical Description:</b> Colorless to white crystals or a granular powder with a faint, benzaldehyde-like odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 242.2 <b>BP:</b> Decomposes explosively <b>Sol:</b> <1% <b>Fl.P.:</b> 176°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.33 <b>VP:</b> <1 mmHg <b>MLT:</b> 217°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid (easily ignited and burns very rapidly).		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>50 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>125 mg/m<sup>3</sup>:</b> Sa:Cf*/PapriHie* <b>250 mg/m<sup>3</sup>:</b> 100F/PapriTHie*/ScbaF/SaF <b>1500 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Combustible substances (wood, paper, etc.), acids, alkalis, alcohols, amines, ethers [Note: Containers may explode when heated. Extremely explosion-sensitive to shock, heat & friction.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; sens derm <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

## B

<b>Benzyl chloride</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> Cl	<b>CAS#:</b> 100-44-7	<b>RTECS#:</b> XS8925000	<b>IDLH:</b> 10 ppm
<b>Conversion:</b> 1 ppm = 5.18 mg/m <sup>3</sup>		<b>DOT:</b> 1738 156			
<b>Synonyms/Trade Names:</b> Chloromethylbenzene, α-Chlorotoluene					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 1 ppm (5 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL:</b> TWA 1 ppm (5 mg/m <sup>3</sup> )		<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1003 <b>OSHA</b> 7			
<b>Physical Description:</b> Colorless to slightly yellow liquid with a pungent, aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 126.6 <b>BP:</b> 354°F <b>Sol:</b> 0.05% <b>Fl.P:</b> 153°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.10 <b>VP:</b> 1 mmHg <b>FRZ:</b> -38°F <b>UEL:</b> ? <b>LEL:</b> 1.1% Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>10 ppm:</b> CcrOvAg*/GmFOvAg/ PapROvAg*/Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOvAg/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids, copper, aluminum, magnesium, iron, zinc, tin [Note: Can polymerize when in contact with all common metals except nickel & lead. Hydrolyzes in H <sub>2</sub> O to benzyl alcohol.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose; lass; irrity; head; skin eruption; pulm edema <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Beryllium &amp; beryllium compounds (as Be)</b>		<b>Formula:</b> Be (metal)	<b>CAS#:</b> 7440-41-7 (metal)	<b>RTECS#:</b> DS1750000 (metal)	<b>IDLH:</b> Ca [4 mg/m <sup>3</sup> (as Be)]
<b>Conversion:</b>		<b>DOT:</b> 1566 154 (compounds); 1567 134 (powder)			
<b>Synonyms/Trade Names:</b> Beryllium Other synonyms vary depending upon the specific beryllium compound.					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca Not to exceed 0.0005 mg/m <sup>3</sup> See Appendix A <b>OSHA PEL:</b> TWA 0.002 mg/m <sup>3</sup> C 0.005 mg/m <sup>3</sup> 0.025 mg/m <sup>3</sup> [30-minute maximum peak]		<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7102, 7300, 7301, 7303, 9102 <b>OSHA</b> ID125G, ID206			
<b>Physical Description:</b> Metal: A hard, brittle, gray-white solid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 9.0 <b>BP:</b> 4532°F <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 1.85 (metal) <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 2349°F <b>UEL:</b> NA <b>LEL:</b> NA	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of a powder or dust.					
<b>Incompatibilities and Reactivities:</b> Acids, caustics, chlorinated hydrocarbons, oxidizers, molten lithium					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Berylliosis (chronic exposure): anor, low-wgt, lass, chest pain, cough, clubbing of fingers, cyan, pulm insufficiency; irrit eyes; dermat; [carc] <b>TO:</b> Eyes, skin, resp sys [lung cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air		

Bismuth telluride, doped with Selenium sulfide (as Bi <sub>2</sub> Te <sub>3</sub> )		Formula:	CAS#:	RTECS#:	IDLH: N.D.
Conversion:		DOT:			
<b>Synonyms/Trade Names:</b> Doped bismuth sesqu telluride, Doped bismuth telluride, Doped bismuth tritelluride, Doped tellurobismuthite [Note: Doped with selenium sulfide. Commercial mix may contain 80% Bi <sub>2</sub> Te <sub>3</sub> , 20% stannous telluride, plus some tellurium.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 0500</b> <b>OSHA ID121</b>	
<b>Physical Description:</b> Gray, crystalline solid that has been enhanced (doped) with a small amount of selenium sulfide (SeS). [Note: Doping alters the conductivity of a semiconductor.]					
<b>Chemical &amp; Physical Properties:</b> Properties are unavailable but should be similar to Bismuth telluride, undoped.  <b>Sp.Gr:</b> ?  Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, moisture					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; garlic breath; in animals: pulm lesions (nonfibrotic) <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

Bismuth telluride, undoped		Formula:	CAS#:	RTECS#:	IDLH: N.D.
Conversion:		DOT:			
<b>Synonyms/Trade Names:</b> Bismuth sesqu telluride, Bismuth telluride, Bismuth tritelluride, Tellurobismuthite					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 0500, 0600</b> <b>OSHA ID121</b>	
<b>Physical Description:</b> Gray, crystalline solid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 800.8 <b>BP:</b> ? <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 7.7 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 1063°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., bromine, chlorine, or fluorine), moisture, nitric acid (decomposes)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; garlic breath <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

## B

<b>Borates, tetra, sodium salts (Anhydrous)</b>		<b>Formula:</b> Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub>	<b>CAS#:</b> 1330-43-4	<b>RTECS#:</b> ED4588000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Anhydrous borax, Borax dehydrated, Disodium salt of boric acid, Disodium tetraborate, Fused borax, Sodium borate (anhydrous), Sodium tetraborate					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL†: none					<b>Measurement Methods (see Table 1):</b> NIOSH 0500 OSHA ID125G
<b>Physical Description:</b> White to gray, odorless powder. [herbicide] [Note: Becomes opaque on exposure to air.]					
<b>Chemical &amp; Physical Properties:</b> MW: 201.2 BP: 2867°F (Decomposes) Sol: 4% FI.P: NA IP: NA Sp.Gr: 2.37 VP: 0 mmHg (approx) MLT: 1366°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: Daily Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Moisture [Note: Forms partial hydrate in moist air.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; derm; epis; cough, dysp TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Borates, tetra, sodium salts (Decahydrate)</b>		<b>Formula:</b> Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·10H <sub>2</sub> O	<b>CAS#:</b> 1303-96-4	<b>RTECS#:</b> VZ2275000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Borax, Borax decahydrate, Sodium borate decahydrate, Sodium tetraborate decahydrate					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none					<b>Measurement Methods (see Table 1):</b> NIOSH 0500 OSHA ID125G
<b>Physical Description:</b> White, odorless, crystalline solid. [herbicide] [Note: Becomes anhydrous at 608°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 381.4 BP: 608°F Sol: 6% FI.P: NA IP: NA Sp.Gr: 1.73 VP: 0 mmHg (approx) MLT: 167°F UEL: NA LEL: NA Noncombustible Solid (an inherent fire retardant).		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: Daily Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Zirconium, strong acids, metallic salts					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; derm; epis; cough, dysp TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Borates, tetra, sodium salts (Pentahydrate)</b>	<b>Formula:</b> Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·5H <sub>2</sub> O	<b>CAS#:</b> 12179-04-3	<b>RTECS#:</b> VZ2540000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Borax pentahydrate, Sodium borate pentahydrate, Sodium tetraborate pentahydrate				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 0500 OSHA ID125G	
<b>Physical Description:</b> Colorless or white, odorless crystals or free-flowing powder. [herbicide] <b>[Note:</b> Begins to lose water of hydration at 252°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 291.4 BP: ? Sol: 3% Fl.P: NA IP: NA Sp.Gr: 1.82 VP: 0 mmHg (approx) MLT: 392°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: Daily Remove: N.R. Change: Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.		
<b>Incompatibilities and Reactivities:</b> None reported <b>[Note:</b> See the reactivities & incompatibilities reported for the related substance Borax decahydrate above.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; dermat; epis; cough, dysp TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Boron oxide</b>	<b>Formula:</b> B <sub>2</sub> O <sub>3</sub>	<b>CAS#:</b> 1303-86-2	<b>RTECS#:</b> ED7900000	<b>IDLH:</b> 2000 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Boric anhydride, Boric oxide, Boron trioxide				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL†: TWA 15 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 0500	
<b>Physical Description:</b> Colorless, semitransparent lumps or hard, white, odorless crystals.				
<b>Chemical &amp; Physical Properties:</b> MW: 69.6 BP: 3380°F Sol: 3% Fl.P: NA IP: 13.50 eV Sp.Gr: 2.46 VP: 0 mmHg (approx) MLT: 842°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> 50 mg/m <sup>3</sup> : Qm* 100 mg/m <sup>3</sup> : 95XQ*/Sa* 250 mg/m <sup>3</sup> : Sa:C*/PaprHie* 500 mg/m <sup>3</sup> : 100F/PaprTHie*/ScbaF/SaF 2000 mg/m <sup>3</sup> : SaF:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water <b>[Note:</b> Reacts slowly with water to form boric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; cough; conj; skin eryt TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Fresh air Swallow: Medical attention immed		

## B

<b>Boron tribromide</b>	<b>Formula:</b> BBr <sub>3</sub>	<b>CAS#:</b> 10294-33-4	<b>RTECS#:</b> ED7400000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 10.25 mg/m <sup>3</sup>	<b>DOT:</b> 2692 157			
<b>Synonyms/Trade Names:</b> Boron bromide, Tribromoborane				
<b>Exposure Limits:</b> NIOSH REL: C 1 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless, fuming liquid with a sharp, irritating odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 250.5 BP: 194°F Sol: Decomposes F.L.P: NA IP: 9.70 eV Sp.Gr(65°F): 2.64 VP(57°F): 40 mmHg FRZ: -51°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Moisture, water, heat, potassium, sodium, alcohols [Note: Attacks metals, wood & rubber. Reacts with water to form boric acid and hydrogen bromide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; dysp, pulm edema TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Boron trifluoride</b>	<b>Formula:</b> BF <sub>3</sub>	<b>CAS#:</b> 7637-07-2	<b>RTECS#:</b> ED2275000	<b>IDLH:</b> 25 ppm
<b>Conversion:</b> 1 ppm = 2.77 mg/m <sup>3</sup>	<b>DOT:</b> 1008 125			
<b>Synonyms/Trade Names:</b> Boron fluoride, Trifluoroborane				
<b>Exposure Limits:</b> NIOSH REL: C 1 ppm (3 mg/m <sup>3</sup> ) OSHA PEL: C 1 ppm (3 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a pungent, suffocating odor. [Note: Forms dense white fumes in moist air. Shipped as a nonliquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 67.8 BP: -148°F Sol: 106% (in cold H <sub>2</sub> O) F.L.P: NA IP: 15.50 eV RGasD: 2.38 VP: >50 atm FRZ: -196°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10 ppm:</b> Sa* <b>25 ppm:</b> Sa:C*/ScbaF/SaF <b>§:</b> ScbaF;Pd,Pp/SaF;Pd,Pp;AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Alkali metals, calcium oxide [Note: Hydrolyzes in moist air or hot water to form boric acid, hydrogen fluoride & fluoboric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, nose, resp sys; epis; eye, skin burns; in animals: pneu; kidney damage TO: Eyes, skin, resp sys, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support	

<b>Bromacil</b>	<b>Formula:</b> C <sub>9</sub> H <sub>13</sub> BrN <sub>2</sub> O <sub>2</sub>	<b>CAS#:</b> 314-40-9	<b>RTECS#:</b> YQ9100000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 10.68 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 5-Bromo-3-sec-butyl-6-methyluracil, 5-Bromo-6-methyl-3-(1-methylpropyl)uracil				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> Odorless, colorless to white, crystalline solid. [herbicide] [Note: Commercially available as a wettable powder or in liquid formulations.]				
<b>Chemical &amp; Physical Properties:</b> MW: 261.2 BP: Sublimes Sol(77°F): 0.08% F.I.P: NA IP: ? Sp.Gr: 1.55 VP(212°F): 0.0008 mmHg MLT: 317°F (Sublimes) UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong acids (decomposes slowly), oxidizers, heat, sparks, open flames				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; in animals: thyroid inj TO: Eyes, skin, resp sys, thyroid			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

B

<b>Bromine</b>	<b>Formula:</b> Br <sub>2</sub>	<b>CAS#:</b> 7726-95-6	<b>RTECS#:</b> EF9100000	<b>IDLH:</b> 3 ppm
<b>Conversion:</b> 1 ppm = 6.54 mg/m <sup>3</sup>	<b>DOT:</b> 1744 154			
<b>Synonyms/Trade Names:</b> Molecular bromine				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.7 mg/m <sup>3</sup> ) ST 0.3 ppm (2 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.1 ppm (0.7 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6011 OSHA ID108	
<b>Physical Description:</b> Dark reddish-brown, fuming liquid with suffocating, irritating fumes.				
<b>Chemical &amp; Physical Properties:</b> MW: 159.8 BP: 139°F Sol: 4% F.I.P: NA IP: 10.55 eV Sp.Gr: 3.12 VP: 172 mmHg FRZ: 19°F UEL: NA LEL: NA Noncombustible Liquid, but accelerates the burning of combustibles.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 2.5 ppm: Sa:CfE/PapRS <sub>2</sub> E 3 ppm: CrFS <sub>2</sub> /GmFS <sub>2</sub> /PapTS <sub>2</sub> E/L ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS <sub>2</sub> /ScbaE	
<b>Incompatibilities and Reactivities:</b> Combustible organics (sawdust, wood, cotton, straw, etc.), aluminum, readily oxidizable materials, ammonia, hydrogen, acetylene, phosphorus, potassium, sodium [Note: Corrodes iron, steel, stainless steel & copper.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Dizz, head; lac, epis; cough, feeling of oppression, pulm edema, pneu; abdom pain, diarr; measles-like eruptions; eye, skin burns TO: Resp sys, eyes, CNS, skin			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

## B

<b>Bromine pentafluoride</b>		<b>Formula:</b> BrF <sub>5</sub>	<b>CAS#:</b> 7789-30-2	<b>RTECS#:</b> EF9350000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.15 mg/m <sup>3</sup>		<b>DOT:</b> 1745 144			
<b>Synonyms/Trade Names:</b> Bromine fluoride					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.7 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless to pale-yellow, fuming liquid with a pungent odor. [ <b>Note:</b> A colorless gas above 105°F. Shipped as a compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 174.9 <b>BP:</b> 105°F <b>Sol:</b> Reacts violently <b>F.I.P:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 2.48 <b>VP:</b> 328 mmHg <b>FRZ:</b> -77°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Liquid, but a very powerful oxidizer.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Acids, halogens, arsenic, selenium, sulfur, glass, organic materials, water [ <b>Note:</b> Reacts with all elements except inert gases, nitrogen & oxygen.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; corn nec; skin burns; cough, dysp, pulm edema; liver, kidney inj <b>TO:</b> Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Bromoform</b>		<b>Formula:</b> CHBr <sub>3</sub>	<b>CAS#:</b> 75-25-2	<b>RTECS#:</b> PB5600000	<b>IDLH:</b> 850 ppm
<b>Conversion:</b> 1 ppm = 10.34 mg/m <sup>3</sup>		<b>DOT:</b> 2515 159			
<b>Synonyms/Trade Names:</b> Methyl tribromide, Tribromomethane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 ppm (5 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL:</b> TWA 0.5 ppm (5 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1003</b> <b>OSHA 7</b>	
<b>Physical Description:</b> Colorless to yellow liquid with a chloroform-like odor. [ <b>Note:</b> A solid below 47°F.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 252.8 <b>BP:</b> 301°F <b>Sol:</b> 0.1% <b>F.I.P:</b> NA <b>IP:</b> 10.48 eV <b>Sp.Gr:</b> 2.89 <b>VP:</b> 5 mmHg <b>FRZ:</b> 47°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>12.5 ppm:</b> Sa:Cff/Pap/OvE <b>25 ppm:</b> CcrFOV/GmFOV/PaprTOvE/ ScbaF/SaF <b>850 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Lithium, sodium, potassium, calcium, aluminum, zinc, magnesium, strong caustics, acetone [ <b>Note:</b> Gradually decomposes, acquiring yellow color; air & light accelerate decomposition.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; CNS depres; liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1,3-Butadiene</b>	<b>Formula:</b> CH <sub>2</sub> =CHCH=CH <sub>2</sub>	<b>CAS#:</b> 106-99-0	<b>RTECS#:</b> EI9275000	<b>IDLH:</b> Ca [2000 ppm] [10%LEL]
<b>Conversion:</b> 1 ppm = 2.21 mg/m <sup>3</sup>		<b>DOT:</b> 1010 116P (inhibited)		
<b>Synonyms/Trade Names:</b> Biethylene, Bivinyll, Butadiene, Divinyll, Erythrene, Vinyl ethylene				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1051] TWA 1 ppm ST 5 ppm			<b>Measurement Methods</b> (see Table 1): NIOSH 1024 OSHA 56	
<b>Physical Description:</b> Colorless gas with a mild aromatic or gasoline-like odor. [Note: A liquid below 24°F. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 54.1 BP: 24°F Sol: Insoluble Fl.P: NA (Gas) -105°F (Liquid) IP: 9.07 eV RGasD: 1.88 Sp.Gr: 0.65 (Liquid at 24°F) VP: 2.4 atm FRZ: -164°F UEL: 12.0% LEL: 2.0% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFS/ScbaE  See Appendix E (page 351)
<b>Incompatibilities and Reactivities:</b> Phenol, chlorine dioxide, copper, crotonaldehyde [Note: May contain inhibitors (e.g., tributylcatechol) to prevent self-polymerization. May form explosive peroxides upon exposure to air.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Irrit eyes, nose, throat; drow, dizz; liquid: frostbite; terato, repro effects; [carc] TO: Eyes, resp sys, CNS, repro sys [hemato cancer]			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

B

<b>n-Butane</b>	<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 106-97-8	<b>RTECS#:</b> EJ4200000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.38 mg/m <sup>3</sup>		<b>DOT:</b> 1011 115; 1075 115		
<b>Synonyms/Trade Names:</b> normal-Butane, Butyl hydride, Diethyl, Methyl ethyl methane [Note: Also see specific listing for Isobutane.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 800 ppm (1900 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA 56	
<b>Physical Description:</b> Colorless gas with a gasoline-like or natural gas odor. [Note: Shipped as a liquefied compressed gas. A liquid below 31°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 58.1 BP: 31°F Sol: Slight Fl.P: NA (Gas) IP: 10.63 eV RGasD: 2.11 Sp.Gr: 0.6 (Liquid at 31°F) VP: 2.05 atm FRZ: -217°F UEL: 8.4% LEL: 1.6% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., nitrates and perchlorates), chlorine, fluorine, (nickel carbonyl + oxygen)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Drow, narco, asphy; liquid: frostbite TO: CNS			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

## B

<b>2-Butanone</b>		<b>Formula:</b> CH <sub>3</sub> COCH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 78-93-3	<b>RTECS#:</b> EL6475000	<b>IDLH:</b> 3000 ppm
<b>Conversion:</b> 1 ppm = 2.95 mg/m <sup>3</sup>		<b>DOT:</b> 1193 127			
<b>Synonyms/Trade Names:</b> Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 200 ppm (590 mg/m <sup>3</sup> ) ST 300 ppm (885 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 200 ppm (590 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 2500, 2555, 3800 <b>OSHA</b> 16, 84, 1004	
<b>Physical Description:</b> Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 72.1 <b>BP:</b> 175°F <b>Sol:</b> 28% <b>Fl.P:</b> 16°F <b>IP:</b> 9.54 eV <b>Sp.Gr:</b> 0.81 <b>VP:</b> 78 mmHg <b>FRZ:</b> -123°F <b>UEL(200°F):</b> 11.4% <b>LEL(200°F):</b> 1.4% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>3000 ppm:</b> Sa:Cf£/PapOv£/CcrFOv/ GmFOv/ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, amines, ammonia, inorganic acids, caustics, isocyanates, pyridines					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose; head; dizz; vomit; derm <b>TO:</b> Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed	

<b>2-Butoxyethanol</b>		<b>Formula:</b> C <sub>4</sub> H <sub>9</sub> OCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 111-76-2	<b>RTECS#:</b> KJ8575000	<b>IDLH:</b> 700 ppm
<b>Conversion:</b> 1 ppm = 4.83 mg/m <sup>3</sup>		<b>DOT:</b> 2369 152			
<b>Synonyms/Trade Names:</b> Butyl Cellosolve®, Butyl oxitol, Dowanol® EB, EGBE, Ektasolve EB®, Ethylene glycol monobutyl ether, Jeffersol EB					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 ppm (24 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> TWA 50 ppm (240 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1403 <b>OSHA</b> 83	
<b>Physical Description:</b> Colorless liquid with a mild, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 118.2 <b>BP:</b> 339°F <b>Sol:</b> Miscible <b>Fl.P:</b> 143°F <b>IP:</b> 10.00 eV <b>Sp.Gr:</b> 0.90 <b>VP:</b> 0.8 mmHg <b>FRZ:</b> -107°F <b>UEL(275°F):</b> 12.7% <b>LEL(200°F):</b> 1.1% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>50 ppm:</b> CcrOv*/Sa* <b>125 ppm:</b> Sa:Cf*/PapOv* <b>250 ppm:</b> CcrFOv/GmFOv/PapTOv*/ ScbaF/SaF <b>700 ppm:</b> SaF: Pd, Pp <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; hemolysis, hema; CNS depres, head; vomit <b>TO:</b> Eyes, skin, resp sys, CNS, hemato sys, blood, kidneys, liver, lymphoid sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2-Butoxyethanol acetate</b>		<b>Formula:</b> <chem>C4H9O(CH2)2OCOCH3</chem>	<b>CAS#:</b> 112-07-2	<b>RTECS#:</b> KJ8925000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.55 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-Butoxyethyl acetate, Butyl Cellosolve® acetate, Butyl glycol acetate, EGBEA, Ektasolve EB® acetate, Ethylene glycol monobutyl ether acetate					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (33 mg/m <sup>3</sup> ) OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): OSHA 83	
<b>Physical Description:</b> Colorless liquid with a pleasant, sweet, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 160.2 BP: 378°F Sol: 1.5% Fl.P: 160°F IP: ? Sp.Gr: 0.94 VP: 0.3 mmHg FRZ: -82°F UEL(275°F): 8.54% LEL(200°F): 0.88% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>50 ppm:</b> CcrOv*/Sa* <b>125 ppm:</b> Sa:Cf*/PaprOv* <b>250 ppm:</b> CcrFOv/GmFOv/PaprTOv*/ScbaF/SaF <b>700 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; hemolysis, hema; CNS depres, head; vomit TO: Eyes, skin, resp sys, CNS, hemato sys, blood, kidneys, liver, lymphoid sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>n-Butyl acetate</b>		<b>Formula:</b> <chem>CH3COO[CH2]3CH3</chem>	<b>CAS#:</b> 123-86-4	<b>RTECS#:</b> AF7350000	<b>IDLH:</b> 1700 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>		<b>DOT:</b> 1123 129			
<b>Synonyms/Trade Names:</b> Butyl acetate, n-Butyl ester of acetic acid, Butyl ethanoate					
<b>Exposure Limits:</b> NIOSH REL: TWA 150 ppm (710 mg/m <sup>3</sup> ) ST 200 ppm (950 mg/m <sup>3</sup> ) OSHA PEL†: TWA 150 ppm (710 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1450 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 258°F Sol: 1% Fl.P: 72°F IP: 10.00 eV Sp.Gr: 0.88 VP: 10 mmHg FRZ: -107°F UEL: 7.6% LEL: 1.7% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1500 ppm:</b> CcrOv*/Sa* <b>1700 ppm:</b> Sa:Cf*/PaprOv*/CcrFOv/GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; head, drow, narco TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

## B

<b>sec-Butyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOCH(CH <sub>3</sub> )CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 105-46-4	<b>RTECS#:</b> AF7380000	<b>IDLH:</b> 1700 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>		<b>DOT:</b> 1123 129			
<b>Synonyms/Trade Names:</b> sec-Butyl ester of acetic acid, 1-Methylpropyl acetate					
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (950 mg/m <sup>3</sup> ) OSHA PEL: TWA 200 ppm (950 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1450 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a pleasant, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 234°F Sol: 0.8% F.I.P: 62°F IP: 9.91 eV Sp.Gr: 0.86 VP: 10 mmHg FRZ: -100°F UEL: 9.8% LEL: 1.7% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1700 ppm:</b> Sa:Cf£/Paprov£/CcrFOv/ GmFOv/ScbaF/SaF <b>£:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes; head; drow; dryness upper resp sys, skin; narco TO: Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>tert-Butyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOC(CH <sub>3</sub> ) <sub>3</sub>	<b>CAS#:</b> 540-88-5	<b>RTECS#:</b> AF7400000	<b>IDLH:</b> 1500 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>		<b>DOT:</b> 1123 129			
<b>Synonyms/Trade Names:</b> tert-Butyl ester of acetic acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (950 mg/m <sup>3</sup> ) OSHA PEL: TWA 200 ppm (950 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1450 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 208°F Sol: Insoluble F.I.P: 72°F IP: ? Sp.Gr: 0.87 VP: ? FRZ: ? UEL: ? LEL: 1.5% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1500 ppm:</b> Sa:Cf£/Paprov£/CcrFOv/ GmFOv/ScbaF/SaF <b>£:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Itch, inflamm eyes; irrit upper resp tract; head; narco; derm TO: Resp sys, eyes, skin, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Butyl acrylate</b>		<b>Formula:</b> CH <sub>2</sub> =CHCOOC <sub>4</sub> H <sub>9</sub>	<b>CAS#:</b> 141-32-2	<b>RTECS#:</b> UD3150000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.24 mg/m <sup>3</sup>		<b>DOT:</b> 2348 130P			
<b>Synonyms/Trade Names:</b> n-Butyl acrylate, Butyl ester of acrylic acid, Butyl-2-propenoate					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (55 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA PV2011	
<b>Physical Description:</b> Clear, colorless liquid with a strong, fruity odor. [Note: Highly reactive; may contain an inhibitor to prevent spontaneous polymerization.]					
<b>Chemical &amp; Physical Properties:</b> MW: 128.2 BP: 293°F Sol: 0.1% F.L.P.: 103°F IP: ? Sp.Gr: 0.89 VP: 4 mmHg FRZ: -83°F UEL: 9.9% LEL: 1.5% Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong acids & alkalis, amines, halogens, hydrogen compounds, oxidizers, heat, flame, sunlight [Note: Polymerizes readily on heating.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys; sens derm; dysp TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

B

<b>n-Butyl alcohol</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 71-36-3	<b>RTECS#:</b> EO1400000	<b>IDLH:</b> 1400 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1120 129			
<b>Synonyms/Trade Names:</b> 1-Butanol, n-Butanol, Butyl alcohol, 1-Hydroxybutane, n-Propyl carbinol					
<b>Exposure Limits:</b> NIOSH REL: C 50 ppm (150 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 100 ppm (300 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1401, 1405 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a strong, characteristic, mildly alcoholic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 243°F Sol: 9% F.L.P.: 84°F IP: 10.04 eV Sp.Gr: 0.81 VP: 6 mmHg FRZ: -129°F UEL: 11.2% LEL: 1.4% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 1250 ppm: Sa:CfE/PapRovE 1400 ppm: CcrFOV/GmFOV/PapRTOvE/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong mineral acids, alkali metals, halogens					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose, throat; head, dizz, drow; corn inflamm, blurred vision, lac, photo; derm; possible auditory nerve damage, hearing loss; CNS depres TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

## B

<b>sec-Butyl alcohol</b>		<b>Formula:</b> CH <sub>3</sub> CH(OH)CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 78-92-2	<b>RTECS#:</b> EO1750000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1120 129			
<b>Synonyms/Trade Names:</b> 2-Butanol, Butylene hydrate, 2-Hydroxybutane, Methyl ethyl carbinol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (305 mg/m <sup>3</sup> ) ST 150 ppm (455 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 150 ppm (450 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1401, 1405 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a strong, pleasant odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 74.1 <b>BP:</b> 211°F <b>Sol:</b> 16% <b>Fl.P:</b> 75°F <b>IP:</b> 10.10 eV <b>Sp.Gr:</b> 0.81 <b>VP:</b> 12 mmHg <b>FRZ:</b> -175°F <b>UEL(212°F):</b> 9.8% <b>LEL(212°F):</b> 1.7% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>1000 ppm:</b> CcrOv*/Sa* <b>2000 ppm:</b> Sa:Cf*/PaprOv*/CcrFOv/ GmFOv/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, organic peroxides, perchloric & permonosulfuric acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>tert-Butyl alcohol</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>3</sub> COH	<b>CAS#:</b> 75-65-0	<b>RTECS#:</b> EO1925000	<b>IDLH:</b> 1600 ppm
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1120 129			
<b>Synonyms/Trade Names:</b> 2-Methyl-2-propanol, Trimethyl carbinol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (300 mg/m <sup>3</sup> ) ST 150 ppm (450 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 100 ppm (300 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1400 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless solid or liquid (above 77°F) with a camphor-like odor. [Note: Often used in aqueous solutions.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 74.1 <b>BP:</b> 180°F <b>Sol:</b> Miscible <b>Fl.P:</b> 52°F <b>IP:</b> 9.70 eV <b>Sp.Gr:</b> 0.79 (Solid) <b>VP(77°F):</b> 42 mmHg <b>FRZ:</b> 78°F <b>UEL:</b> 8.0% <b>LEL:</b> 2.4% Combustible Solid Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>1600 ppm:</b> Sa:Cfℓ/PaprOvℓ/CcrFOv/ GmFOv/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong mineral acids, strong hydrochloric acid, oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; drow, narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>n-Butylamine</b>	<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> NH <sub>2</sub>	<b>CAS#:</b> 109-73-9	<b>RTECS#:</b> EO2975000	<b>IDLH:</b> 300 ppm
<b>Conversion:</b> 1 ppm = 2.99 mg/m <sup>3</sup>	<b>DOT:</b> 1125 132			
<b>Synonyms/Trade Names:</b> 1-Aminobutane, Butylamine				
<b>Exposure Limits:</b> NIOSH REL: C 5 ppm (15 mg/m <sup>3</sup> ) [skin] OSHA PEL: C 5 ppm (15 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2012	
<b>Physical Description:</b> Colorless liquid with a fishy, ammonia-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 73.2 BP: 172°F Sol: Miscible Fl.P: 10°F IP: 8.71 eV Sp.Gr: 0.74 VP: 82 mmHg FRZ: -58°F UEL: 9.8% LEL: 1.7% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>50 ppm:</b> CcrS*/Sa* <b>125 ppm:</b> Sa: Cf*/Paprs* <b>250 ppm:</b> CcrFS/GmFS/PapTS*/ ScbaF/SaF <b>300 ppm:</b> SaF/Pd,Pp §: ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids [Note: May corrode some metals in presence of water.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; head; skin flush, burns TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

B

<b>tert-Butyl chromate</b>	<b>Formula:</b> [(CH <sub>3</sub> ) <sub>3</sub> CO] <sub>2</sub> CrO <sub>2</sub>	<b>CAS#:</b> 1189-85-1	<b>RTECS#:</b> GB2900000	<b>IDLH:</b> Ca [15 mg/m <sup>3</sup> {as Cr(VI)}]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> di-tert-Butyl ester of chromic acid				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.001 mg Cr(VI)/m <sup>3</sup> See Appendix A See Appendix C OSHA PEL: C 0.1 mg CrO <sub>2</sub> /m <sup>3</sup> [skin] See Appendix C			<b>Measurement Methods</b> (see Table 1): NIOSH 7604 OSHA ID103, ID215	
<b>Physical Description:</b> Liquid. [Note: Solidifies at 32-23°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 230.3 BP: ? Sol: ? Fl.P: ? IP: ? Sp.Gr: ? VP: ? FRZ: 32-23°F UEL: ? LEL: ?	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ¥: ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFOV100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Reducing agents, moisture, acids, alcohols, hydrazine, combustible materials				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; drow, musc weak; skin ulcers; lung changes; [carc] TO: Eyes, skin, resp sys, CNS [lung cancer]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

B

<b>n-Butyl glycidyl ether</b>		<b>Formula:</b> C <sub>7</sub> H <sub>14</sub> O <sub>2</sub>	<b>CAS#:</b> 2426-08-6	<b>RTECS#:</b> TX4200000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> BGE; 1,2-Epoxy-3-butoxypropane					
<b>Exposure Limits:</b> NIOSH REL: C 5.6 ppm (30 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: TWA 50 ppm (270 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1616 OSHA 7	
<b>Physical Description:</b> Colorless liquid with an irritating odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 130.2 BP: 327°F Sol: 2% Fl.P: 130°F IP: ? Sp.Gr: 0.91 VP(77°F): 3 mmHg FRZ: ? UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>56 ppm:</b> CcrOv*/Sa* <b>140 ppm:</b> Sa:Cf*/PaprOv* <b>250 ppm:</b> CcrFOv/GmFOv/PapTOv*/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp;AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; skin sens; narco; possible hemato effects; CNS depres TO: Eyes, skin, resp sys, CNS, blood			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>n-Butyl lactate</b>		<b>Formula:</b> CH <sub>2</sub> CH(OH)COOC <sub>4</sub> H <sub>9</sub>	<b>CAS#:</b> 138-22-7	<b>RTECS#:</b> OD4025000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.98 mg/m <sup>3</sup>		<b>DOT:</b> 1993 128 (combustible liquid, n.o.s.)			
<b>Synonyms/Trade Names:</b> Butyl ester of 2-hydroxypropanoic acid, Butyl ester of lactic acid, Butyl lactate					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (25 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Clear, colorless to white liquid with a mild, transient odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 146.2 BP: 370°F Sol: Slight Fl.P: 160°F IP: ? Sp.Gr: 0.98 VP: 0.4 mmHg FRZ: -45°F UEL: ? LEL: 1.15% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong acids & bases, strong oxidizers, heat, sparks, open flames					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; drow, head, CNS depres; nau, vomit TO: Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>n-Butyl mercaptan</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> SH	<b>CAS#:</b> 109-79-5	<b>RTECS#:</b> EK6300000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 3.69 mg/m <sup>3</sup>		<b>DOT:</b> 2347 130			
<b>Synonyms/Trade Names:</b> Butanethiol, 1-Butanethiol, n-Butanethiol, 1-Mercaptobutane					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (1.8 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: TWA 10 ppm (35 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 2525, 2542	
<b>Physical Description:</b> Colorless liquid with a strong, garlic-, cabbage-, or skunk-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 90.2 BP: 209°F Sol: 0.06% Fl.P: 35°F IP: 9.15 eV Sp.Gr: 0.83 VP: 35 mmHg FRZ: -176°F UEL: ? LEL: ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cff/PaprvOv <b>25 ppm:</b> CcrFov/GmFOv/PaprvTOv/ScbaF/SaF <b>500 ppm:</b> Sa:Pd,Pp* §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as dry bleaches), acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; musc weak, mal, sweat, nau, vomit, head, conf; in animals: narco, inco, lass; cyan, pulm irrit; liver, kidney damage TO: Eyes, skin, resp sys, CNS, liver, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

B

<b>o-sec-Butylphenol</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH(CH <sub>3</sub> )C <sub>6</sub> H <sub>4</sub> OH	<b>CAS#:</b> 89-72-5	<b>RTECS#:</b> SJ8920000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.14 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-sec-Butylphenol; 2-(1-Methylpropyl)phenol					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (30 mg/m <sup>3</sup> ) [skin] OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid or solid (below 61°F).					
<b>Chemical &amp; Physical Properties:</b> MW: 150.2 BP: 227°F Sol: Insoluble Fl.P: 225°F IP: ? Sp.Gr: 0.89 VP: Low FRZ: 61°F UEL: ? LEL: ? Class IIB Combustible Liquid Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; skin burns TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

B

<b>p-tert-Butyltoluene</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>3</sub> CC <sub>6</sub> H <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 98-51-1	<b>RTECS#:</b> XS8400000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 6.07 mg/m <sup>3</sup>		<b>DOT:</b> 2667 152			
<b>Synonyms/Trade Names:</b> 4-tert-Butyltoluene, 1-Methyl-4-tert-butylbenzene					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (60 mg/m <sup>3</sup> ) ST 20 ppm (120 mg/m <sup>3</sup> ) OSHA PEL†: TWA 10 ppm (60 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1501 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a distinct aromatic odor, somewhat like gasoline.					
<b>Chemical &amp; Physical Properties:</b> MW: 148.3 BP: 379°F Sol: Insoluble FI.P: 155°F IP: 8.28 eV Sp.Gr: 0.86 VP(77°F): 0.7 mmHg FRZ: -62°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>100 ppm:</b> Sa:Cf£/PaprOv£/CcrFOv/ GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin; dry nose, throat; head; low BP, tacar, abnor CVS stress; CNS, hemato depres; metallic taste; liver, kidney inj <b>TO:</b> Eyes, skin, resp sys, CVS, CNS, bone marrow, liver, kidneys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>n-Butyronitrile</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CN	<b>CAS#:</b> 109-74-0	<b>RTECS#:</b> ET8750000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.83 mg/m <sup>3</sup>		<b>DOT:</b> 2411 131			
<b>Synonyms/Trade Names:</b> Butanenitrile, Butyronitrile, 1-Cyanopropane, Propyl cyanide, n-Propyl cyanide					
<b>Exposure Limits:</b> NIOSH REL: TWA 8 ppm (22 mg/m <sup>3</sup> ) OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): NIOSH 1606 (adapt)	
<b>Physical Description:</b> Colorless liquid with a sharp, suffocating odor. [Note: Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> MW: 69.1 BP: 244°F Sol(77°F): 3% FI.P: 62°F IP: 11.67 eV Sp.Gr: 0.81 VP: 14 mmHg FRZ: -170°F UEL: ? LEL: 1.65% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>80 ppm:</b> CcrOv/Sa <b>200 ppm:</b> Sa:Cf/PaprOv <b>400 ppm:</b> CcrFOv/GmFOv/PaprTOv/ ScbaF/SaF <b>1000 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers & reducing agents, strong acids & bases					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; head, dizz, lass, conf, convuls; dysp; abdom pain, nau, vomit <b>TO:</b> Eyes, skin, resp sys, CNS, CVS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Cadmium dust (as Cd)</b>	<b>Formula:</b> Cd (metal)	<b>CAS#:</b> 7440-43-9 (metal)	<b>RTECS#:</b> EU9800000 (metal)	<b>IDLH:</b> Ca [9 mg/m <sup>3</sup> (as Cd)]
<b>Conversion:</b>	<b>DOT:</b> 2570 154 (cadmium compound)			
<b>Synonyms/Trade Names:</b> Cadmium metal; Cadmium Other synonyms vary depending upon the specific cadmium compound.				
<b>Exposure Limits:</b> NIOSH REL*: Ca See Appendix A OSHA PEL*: [1910.1027] TWA 0.005 mg/m <sup>3</sup> [*Note: The REL and PEL apply to all Cadmium compounds (as Cd).]			<b>Measurement Methods</b> (see Table 1): NIOSH 7048, 7300, 7301, 7303, 9102 OSHA ID121, ID125G, ID189, ID206	
<b>Physical Description:</b> Metal: Silver-white, blue-tinged lustrous, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 112.4 BP: 1409°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 8.65 (metal) VP: 0 mmHg (approx) MLT: 610°F UEL: NA LEL: NA Metal: Noncombustible Solid in bulk form, but will burn in powder form.			<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: Daily Remove: N.R. Change: Daily	
			<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE  See Appendix E (page 351)	
			<b>Incompatibilities and Reactivities:</b> Strong oxidizers; elemental sulfur, selenium & tellurium	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing SY: Pulm edema, dysp, cough, chest tight, subs pain; head; chills, musc aches; nau, vomit, diarr; anos, emphy, prot, mild anemia; [carc] TO: Resp sys, kidneys, prostate, blood [prostatic & lung cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

C

<b>Cadmium fume (as Cd)</b>	<b>Formula:</b> CdO/Cd	<b>CAS#:</b> 1306-19-0 (CdO)	<b>RTECS#:</b> EV1930000 (CdO)	<b>IDLH:</b> Ca [9 mg/m <sup>3</sup> (as Cd)]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> CdO: Cadmium monoxide, Cadmium oxide fume Cd: Cadmium				
<b>Exposure Limits:</b> NIOSH REL*: Ca See Appendix A OSHA PEL*: [1910.1027] TWA 0.005 mg/m <sup>3</sup> [*Note: The REL and PEL apply to all Cadmium compounds (as Cd).]			<b>Measurement Methods</b> (see Table 1): NIOSH 7048, 7300, 7301, 7303 OSHA ID121, ID125G, ID189, ID206	
<b>Physical Description:</b> Odorless, yellow-brown, finely divided particulate dispersed in air. [*Note: See listing for Cadmium dust for properties of Cd.]				
<b>Chemical &amp; Physical Properties:</b> MW: 128.4 BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 8.15 (crystalline form) 6.95 (amorphous form) VP: 0 mmHg (approx) MLT: 2599°F UEL: NA LEL: NA Noncombustible Solid			<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: Daily Remove: N.R. Change: Daily	
			<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE  See Appendix E (page 351)	
			<b>Incompatibilities and Reactivities:</b> Not applicable	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Pulm edema, dysp, cough, chest tight, subs pain; head; chills, musc aches; nau, vomit, diarr; emphy, prot, anos, mild anemia; [carc] TO: Resp sys, kidneys, blood [prostatic & lung cancer]			<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Calcium arsenate (as As)</b>		<b>Formula:</b> Ca <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>	<b>CAS#:</b> 7778-44-1	<b>RTECS#:</b> CG0830000	<b>IDLH:</b> Ca [5 mg/m <sup>3</sup> (as As)]
<b>Conversion:</b>		<b>DOT:</b> 1573 151			
<b>Synonyms/Trade Names:</b> Calcium salt (2:3) of arsenic acid, Cucumber dust, Tricalcium arsenate, Tricalcium ortho-arsenate [Note: Also see specific listing for Arsenic (inorganic compounds, as As).]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca C 0.002 mg/m <sup>3</sup> [15-minute] See Appendix A <b>OSHA PEL:</b> [1910.1018] TWA 0.010 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 7900</b> <b>OSHA ID105</b>	
<b>Physical Description:</b> Colorless to white, odorless solid. [insecticide/herbicide]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 398.1 <b>BP:</b> Decomposes <b>Sol(77°F):</b> 0.01% <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 3.62 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> ? <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScaFaF: Pd, Pp/SaF: Pd, Pp: AScaB <b>Escape:</b> 100F/ScaBaE	
<b>Incompatibilities and Reactivities:</b> None reported [Note: Produces toxic fumes of arsenic when heated to decomposition.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Lass; GI dist; peri neur; skin hyperpig, palmar planter hyperkeratoses; dermat; [carc]; in animals: liver damage <b>TO:</b> Eyes, resp sys, liver, skin, CNS, lymphatic sys [lymphatic & lung cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Calcium carbonate</b>		<b>Formula:</b> CaCO <sub>3</sub>	<b>CAS#:</b> 1317-65-3	<b>RTECS#:</b> EV9580000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Calcium salt of carbonic acid [Note: Occurs in nature as limestone, chalk, marble, dolomite, aragonite, calcite & oyster shells.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 7020, 7303</b> <b>OSHA ID121</b>	
<b>Physical Description:</b> White, odorless powder or colorless crystals.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 100.1 <b>BP:</b> Decomposes <b>Sol:</b> 0.001% <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 2.7-2.95 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 1517-2442°F (Decomposes) <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Acids, alum, ammonium salts, mercury & hydrogen, fluorine, magnesium					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, resp sys; cough <b>TO:</b> Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air	

<b>Calcium cyanamide</b>	<b>Formula:</b> CaCN <sub>2</sub>	<b>CAS#:</b> 156-62-7	<b>RTECS#:</b> GS600000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 1403 138 (with >0.1% calcium carbide)			
<b>Synonyms/Trade Names:</b> Calcium carbimide, Cyanamide, Lime nitrogen, Nitrogen lime [ <b>Note:</b> Cyanamide is also a synonym for Hydrogen cyanamide, NH <sub>2</sub> CN.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 0500</b>	
<b>Physical Description:</b> Colorless, gray, or black crystals or powder. [fertilizer] [ <b>Note:</b> Commercial grades may contain calcium carbide.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 80.1 <b>BP:</b> Sublimes <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 2.29 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 2444°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but a fire risk if it contains calcium carbide.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Water [ <b>Note:</b> May polymerize in water or alkaline solutions to dicyanamide. Decomposes in water to form acetylene & ammonia.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; head, dizz, rapid breath, low BP, nau, vomit; skin burns, sens; cough; Antabuse-like effects <b>TO:</b> Eyes, skin, resp sys, vasomotor sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Calcium hydroxide</b>	<b>Formula:</b> Ca(OH) <sub>2</sub>	<b>CAS#:</b> 1305-62-0	<b>RTECS#:</b> EW2800000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Calcium hydrate, Caustic lime, Hydrated lime, Slaked lime				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 7020</b> <b>OSHA ID121</b>	
<b>Physical Description:</b> White, odorless powder. [ <b>Note:</b> Readily absorbs CO <sub>2</sub> from the air to form calcium carbonate.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 74.1 <b>BP:</b> Decomposes <b>Sol(32°F):</b> 0.2% <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 2.24 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 1076°F (Decomposes) (Loses H <sub>2</sub> O) <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Maleic anhydride, phosphorus, nitroethane, nitromethane, nitroparaffins, nitropropane [ <b>Note:</b> Attacks some metals.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; eye, skin burns; skin vesic; cough, bron, pneu <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Calcium oxide</b>	<b>Formula:</b> CaO	<b>CAS#:</b> 1305-78-8	<b>RTECS#:</b> EW3100000	<b>IDLH:</b> 25 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1910 157			
<b>Synonyms/Trade Names:</b> Burned lime, Burnt lime, Lime, Pebble lime, Quick lime, Unslaked lime				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7020, 7303 OSHA ID121	
<b>Physical Description:</b> White or gray, odorless lumps or granular powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 56.1 BP: 5162°F Sol: Reacts F.L.P: NA IP: NA Sp.Gr: 3.34 VP: 0 mmHg (approx) MLT: 4662°F UEL: NA LEL: NA Noncombustible Solid, but will support combustion by liberation of oxygen.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>10 mg/m<sup>3</sup>:</b> Qm <b>20 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>25 mg/m<sup>3</sup>:</b> Sa:Cf/Pap/Hie/100F/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water (liberates heat), fluorine, ethanol [Note: Reacts with water to form calcium hydroxide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp tract; ulcer, perf nasal septum; pneu; derm TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Calcium silicate</b>	<b>Formula:</b> CaSiO <sub>3</sub>	<b>CAS#:</b> 1344-95-2	<b>RTECS#:</b> VV9150000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Calcium hydrosilicate, Calcium metasilicate, Calcium monosilicate, Calcium salt of silicic acid, Wollastonite (mineral)				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 7020 OSHA ID121	
<b>Physical Description:</b> White or cream-colored, free-flowing powder. [Note: The commercial product is prepared from diatomaceous earth & lime.]				
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: ? Sol: 0.01% F.L.P: NA IP: NA Sp.Gr: 2.9 VP: 0 mmHg (approx) MLT: 2804°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.		
<b>Incompatibilities and Reactivities:</b> None reported [Note: After prolonged contact with water, solution reverts to soluble calcium salts & amorphous silica.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, upper resp sys TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air	

<b>Calcium sulfate</b>	<b>Formula:</b> CaSO <sub>4</sub>	<b>CAS#:</b> 7778-18-9	<b>RTECS#:</b> WS6920000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Anhydrous calcium sulfate, Anhydrous gypsum, Anhydrous sulfate of lime, Calcium salt of sulfuric acid [ <b>Note:</b> Gypsum is the dihydrate form & Plaster of Paris is the hemihydrate form.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 0500, 0600	
<b>Physical Description:</b> Odorless, white powder or colorless, crystalline solid. [ <b>Note:</b> May have blue, gray, or reddish tinge.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 136.1 <b>BP:</b> Decomposes <b>Sol:</b> 0.3% <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 2.96 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 2840°F (Decomposes) <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Diazomethane, aluminum, phosphorus, water [ <b>Note:</b> Hygroscopic (i.e., absorbs moisture from the air). Reacts with water to form Gypsum & Plaster of Paris.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; conj; rhinitis, epis <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air	

<b>Camphor (synthetic)</b>	<b>Formula:</b> C <sub>10</sub> H <sub>16</sub> O	<b>CAS#:</b> 76-22-2	<b>RTECS#:</b> EX1225000	<b>IDLH:</b> 200 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2717 133			
<b>Synonyms/Trade Names:</b> 2-Camphonone, Gum camphor, Laurel camphor, Synthetic camphor				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 2 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1301, 2553 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless or white crystals with a penetrating, aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 152.3 <b>BP:</b> 399°F <b>Sol:</b> Insoluble <b>Fl.P:</b> 150°F <b>IP:</b> 8.76 eV <b>Sp.Gr:</b> 0.99 <b>VP:</b> 0.2 mmHg <b>MLT:</b> 345°F <b>UEL:</b> 3.5% <b>LEL:</b> 0.6% Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>50 mg/m<sup>3</sup>:</b> Sa:CfE/PapRovHieE <b>100 mg/m<sup>3</sup>:</b> CcrFOv100/GmFOv100/ PapRTOvHieE/ScbaF/SaF <b>200 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (especially chromic anhydride & potassium permanganate)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; nau, vomit, diarr; head, dizz, excitement, epilep convuls <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Caprolactam</b>	<b>Formula:</b> C <sub>2</sub> H <sub>11</sub> NO	<b>CAS#:</b> 105-60-2	<b>RTECS#:</b> CM3675000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.63 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Aminocaproic lactam, epsilon-Caprolactam, Hexahydro-2H-azepin-2-one, 2-Oxohexamethyleneimine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Dust: TWA 1 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> Vapor: TWA 0.22 ppm (1 mg/m <sup>3</sup> ) ST 0.66 ppm (3 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>OSHA</b> PV2012	
<b>Physical Description:</b> White, crystalline solid or flakes with an unpleasant odor. [ <b>Note:</b> Significant vapor concentrations would be expected only at elevated temperatures.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 113.2 <b>BP:</b> 515°F <b>Sol:</b> 53% <b>F.I.P.:</b> 282°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.01 <b>VP:</b> 0.00000008 mmHg <b>MLT:</b> 156°F <b>UEL:</b> 8.0% <b>LEL:</b> 1.4% Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
			<b>Incompatibilities and Reactivities:</b> Strong oxidizers, (acetic acid + dinitrogen trioxide)	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit skin, eyes, resp sys; epis; derm, skin sens; asthma; irrity, conf, dizz, head; abdom cramps, diarr, nau, vomit; liver, kidney inj <b>TO:</b> Eyes, skin, resp sys, CNS, CVS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Captafol</b>	<b>Formula:</b> C <sub>10</sub> H <sub>2</sub> Cl <sub>14</sub> NO <sub>2</sub> S	<b>CAS#:</b> 2425-06-1	<b>RTECS#:</b> GW4900000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Captofol; Difolatan®; N-((1,1,2,2-Tetrachloroethyl)thio)-4-cyclohexene-1,2-dicarboximide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 0.1 mg/m <sup>3</sup> [skin] See Appendix A			<b>OSHA PEL†:</b> none <b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 0500	
<b>Physical Description:</b> White, crystalline solid with a slight, characteristic pungent odor. [fungicide] [ <b>Note:</b> Available commercially as a wettable powder or in liquid form.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 349.1 <b>BP:</b> Decomposes <b>Sol:</b> 0.0001% <b>F.I.P.:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> ? <b>VP:</b> 0.000008 mmHg <b>MLT:</b> 321°F (Decomposes) <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ⚠: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE
			<b>Incompatibilities and Reactivities:</b> Acids, acid vapors, strong oxidizers	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; derm, skin sens; conj; bron, wheez; diarr, vomit; liver, kidney inj; high BP; in animals: terato effects; [carc] <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys, CVS [in animals: tumors at many sites]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Captan</b>	<b>Formula:</b> C <sub>8</sub> H <sub>8</sub> Cl <sub>2</sub> NO <sub>2</sub> S	<b>CAS#:</b> 133-06-2	<b>RTECS#:</b> GW5075000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Captane; N-Trichloromethylmercapto-4-cyclohexene-1,2-dicarboximide				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 5 mg/m <sup>3</sup> See Appendix A		<b>OSHA PEL†:</b> none		<b>Measurement Methods (see Table 1):</b> NIOSH 5601, 9202, 9205
<b>Physical Description:</b> Odorless, white, crystalline powder. [fungicide] [Note: Commercial product is a yellow powder with a pungent odor.]				
<b>Chemical &amp; Physical Properties:</b> MW: 300.6 BP: Decomposes Sol(77°F): 0.0003% Fl.P: ? IP: NA Sp.Gr: 1.74 VP: 0 mmHg (approx) MLT: 352°F (Decomposes) UEL: ? LEL: ? Combustible Solid; may be dissolved in flammable liquids.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong alkaline materials (e.g., hydrated lime) [Note: Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys; blurred vision; dermatitis; dypsp; diarr, vomit; [carc] TO: Eyes, skin, resp sys, GI tract, liver, kidneys [in animals: duodenal tumors]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Carbaryl</b>	<b>Formula:</b> CH <sub>3</sub> NHCOOC <sub>10</sub> H <sub>7</sub>	<b>CAS#:</b> 63-25-2	<b>RTECS#:</b> EC5950000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2757 151			
<b>Synonyms/Trade Names:</b> α-Naphthyl N-methyl-carbamate, 1-Naphthyl N-Methyl-carbamate, Sevin®				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>		<b>Measurement Methods (see Table 1):</b> NIOSH 5006, 5601 OSHA 63		
<b>Physical Description:</b> White or gray, odorless solid. [pesticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 201.2 BP: Decomposes Sol: 0.01% Fl.P: NA IP: ? Sp.Gr: 1.23 VP(77°F): <0.00004 mmHg MLT: 293°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 50 mg/m <sup>3</sup> ; Sa* 100 mg/m <sup>3</sup> ; Sa:Cf/ScbaF/SaF ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFov100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strongly alkaline pesticides				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Miosis, blurred vision, tear; rhin, saliv; sweat; abdom cramps, nau, vomit, diarr; tremor; cyan; convuls; irrit skin; possible repro effects TO: Resp sys, CNS, CVS, skin, blood chol, repro sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Carbofuran</b>	<b>Formula:</b> C <sub>12</sub> H <sub>16</sub> NO <sub>3</sub>	<b>CAS#:</b> 1563-66-2	<b>RTECS#:</b> FB9450000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2757 151			
<b>Synonyms/Trade Names:</b> 2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate; Furacarb®; Furadan®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5601	
<b>Physical Description:</b> Odorless, white or grayish, crystalline solid. [insecticide] [Note: May be dissolved in a liquid carrier.]				
<b>Chemical &amp; Physical Properties:</b> MW: 221.3 BP: ? Sol(77°F): 0.07% F.I.P: NA IP: NA Sp.Gr: 1.18 VP(77°F): 0.000003 mmHg MLT: 304°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Miosis, blurred vision; sweat, salv, abdom cramps, diarr, head, nau, vomit; lass, musc twitch, inco, convuls TO: CNS, PNS, blood chol		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Carbon black</b>	<b>Formula:</b> C	<b>CAS#:</b> 1333-86-4	<b>RTECS#:</b> FF5800000	<b>IDLH:</b> 1750 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Acetylene black, Channel black, Furnace black, Lamp black, Thermal black				
<b>Exposure Limits:</b> NIOSH REL: TWA 3.5 mg/m <sup>3</sup> Carbon black in presence of polycyclic aromatic hydrocarbons (PAHs): Ca TWA 0.1 mg PAHs/m <sup>3</sup> See Appendix A See Appendix C OSHA PEL: TWA 3.5 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5000 OSHA ID196	
<b>Physical Description:</b> Black, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 12.0 BP: Sublimes Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 1.8-2.1 VP: 0 mmHg (approx) MLT: Sublimes UEL: NA LEL: NA Combustible Solid that may contain flammable hydrocarbons.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 17.5 mg/m <sup>3</sup> : Qm 35 mg/m <sup>3</sup> : 95XQ/Sa 87.5 mg/m <sup>3</sup> : Sa:Cf/PapriHe 175 mg/m <sup>3</sup> : 100F/PapriThie/ScbaF/SaF 1750 mg/m <sup>3</sup> : Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE  In presence of polycyclic aromatic hydrocarbons: NIOSH ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers such as chlorates, bromates & nitrates				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Cough; irrit eyes; in presence of polycyclic aromatic hydrocarbons: [carc] TO: Resp sys, eyes [lymphatic cancer (in presence of PAHs)]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr prompt <b>Breath:</b> Fresh air	

<b>Carbon dioxide</b>	<b>Formula:</b> CO <sub>2</sub>	<b>CAS#:</b> 124-38-9	<b>RTECS#:</b> FF6400000	<b>IDLH:</b> 40,000 ppm
<b>Conversion:</b> 1 ppm = 1.80 mg/m <sup>3</sup>		<b>DOT:</b> 1013 120; 1845 120 (dry ice); 2187 120 (liquid)		
<b>Synonyms/Trade Names:</b> Carbonic acid gas, Dry ice [ <b>Note:</b> Normal constituent of air (about 300 ppm)].				
<b>Exposure Limits:</b> NIOSH REL: TWA 5000 ppm (9000 mg/m <sup>3</sup> ) ST 30,000 ppm (54,000 mg/m <sup>3</sup> ) OSHA PEL†: TWA 5000 ppm (9000 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6603 OSHA ID172	
<b>Physical Description:</b> Colorless, odorless gas. [ <b>Note:</b> Shipped as a liquefied compressed gas. Solid form is utilized as dry ice.]				
<b>Chemical &amp; Physical Properties:</b> MW: 44.0 BP: Sublimes Sol(77°F): 0.2% Fl.P: NA IP: 13.77 eV RGasD: 1.53 VP: 56.5 atm MLT: -109°F (Sublimes) UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>40,000 ppm:</b> Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> ScbaE
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid/solid) SY: Head, dizz, restless, pares; dysp; sweat, mal; incr heart rate, card output, BP; coma; asphy; convuls; frostbite (liq, dry ice) TO: Resp sys, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	
<b>Incompatibilities and Reactivities:</b> Dusts of various metals, such as magnesium, zirconium, titanium, aluminum, chromium & manganese are ignitable and explosive when suspended in carbon dioxide. Forms carbonic acid in water.				

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<b>Carbon disulfide</b>	<b>Formula:</b> CS <sub>2</sub>	<b>CAS#:</b> 75-15-0	<b>RTECS#:</b> FF6650000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 3.11 mg/m <sup>3</sup>		<b>DOT:</b> 1131 131		
<b>Synonyms/Trade Names:</b> Carbon bisulfide				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (3 mg/m <sup>3</sup> ) ST 10 ppm (30 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 20 ppm C 30 ppm 100 ppm (30-minute maximum peak)			<b>Measurement Methods</b> (see Table 1): NIOSH 1600, 3800	
<b>Physical Description:</b> Colorless to faint-yellow liquid with a sweet ether-like odor. [ <b>Note:</b> Reagent grades are foul smelling.]				
<b>Chemical &amp; Physical Properties:</b> MW: 76.1 BP: 116°F Sol: 0.3% Fl.P: -22°F IP: 10.08 eV Sp.Gr: 1.26 VP: 297 mmHg FRZ: -169°F UEL: 50.0% LEL: 1.3% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>10 ppm:</b> CcrOv/Sa <b>25 ppm:</b> Sa:Cf/PapRov <b>50 ppm:</b> CcrFOv/GmFOv/PapRTOV/ ScbaF/SaF <b>500 ppm:</b> Sa: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Dizz, head, poor sleep, lass, anxi, anor, low-wgt; psychosis; polyneur; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver inj; eye, skin burns; dermat; repro effects TO: CNS, PNS, CVS, eyes, kidneys, liver, skin, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers; chemically-active metals such as sodium, potassium & zinc; azides; rust; halogens; amines [ <b>Note:</b> Vapors may be ignited by contact with an ordinary light bulb.]				

<b>Carbon monoxide</b>		<b>Formula:</b> CO	<b>CAS#:</b> 630-08-0	<b>RTECS#:</b> FG3500000	<b>IDLH:</b> 1200 ppm
<b>Conversion:</b> 1 ppm = 1.15 mg/m <sup>3</sup>		<b>DOT:</b> 1016 119; 9202 168 (cryogenic liquid)			
<b>Synonyms/Trade Names:</b> Carbon oxide, Flue gas, Monoxide					
<b>Exposure Limits:</b> NIOSH REL: TWA 35 ppm (40 mg/m <sup>3</sup> ) C 200 ppm (229 mg/m <sup>3</sup> ) OSHA PEL†: TWA 50 ppm (55 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 6604 OSHA ID209, ID210	
<b>Physical Description:</b> Colorless, odorless gas. [Note: Shipped as a nonliquefied or liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 28.0 BP: -313°F Sol: 2% FI.P: NA (Gas) IP: 14.01 eV RGasD: 0.97 VP: >35 atm MLT: -337°F UEL: 74% LEL: 12.5% Flammable Gas		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 350 ppm: Sa 875 ppm: Sa:Cf 1200 ppm: GmFS†/ScbaF/SaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS†/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, bromine trifluoride, chlorine trifluoride, lithium					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Head, tachypnea, nau, lass, dizz, conf, halu; cyan; depres S-T segment of electrocardiogram, angina, syncope TO: CVS, lungs, blood, CNS				<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Carbon tetrabromide</b>		<b>Formula:</b> CBr <sub>4</sub>	<b>CAS#:</b> 558-13-4	<b>RTECS#:</b> FG4725000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 13.57 mg/m <sup>3</sup>		<b>DOT:</b> 2516 151			
<b>Synonyms/Trade Names:</b> Carbon bromide, Methane tetrabromide, Tetrabromomethane					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (1.4 mg/m <sup>3</sup> ) ST 0.3 ppm (4 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless to yellow-brown crystals with a slight odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 331.7 BP: 374°F Sol: 0.02% FI.P: NA IP: 10.31 eV Sp.Gr: 3.42 VP(205°F): 40 mmHg MLT: 194°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: Prevent eye contact Wash skin: Daily Remove: N.R. Change: Daily Provide: Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, hexacyclohexyldilead, lithium					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; lac; lung, liver, kidney inj; in animals: corn damage TO: Eyes, skin, resp sys, liver, kidneys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Carbon tetrachloride</b>	<b>Formula:</b> CCl <sub>4</sub>	<b>CAS#:</b> 56-23-5	<b>RTECS#:</b> FG4900000	<b>IDLH:</b> Ca [200 ppm]
<b>Conversion:</b> 1 ppm = 6.29 mg/m <sup>3</sup>	<b>DOT:</b> 1846 151			
<b>Synonyms/Trade Names:</b> Carbon chloride, Carbon tet, Freon® 10, Halon® 104, Tetrachloromethane				
<b>Exposure Limits:</b> NIOSH REL: Ca ST 2 ppm (12.6 mg/m <sup>3</sup> ) [60-minute] See Appendix A OSHA PEL†: TWA 10 ppm C 25 ppm 200 ppm (5-minute maximum peak in any 4 hours)			<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a characteristic ether-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 153.8 BP: 170°F Sol: 0.05% Fl.P: NA IP: 11.47 eV Sp.Gr: 1.59 VP: 91 mmHg FRZ: -9°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH *: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOV/ScbaE
		<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium & magnesium; fluorine; aluminum [Note: Forms highly toxic phosgene gas when exposed to flames or welding arcs.]		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; CNS depres; nau, vomit; liver, kidney inj; drow, dizz, inco; [carc] TO: CNS, eyes, lungs, liver, kidneys, skin [in animals: liver cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Carbonyl fluoride</b>	<b>Formula:</b> COF <sub>2</sub>	<b>CAS#:</b> 353-50-4	<b>RTECS#:</b> FG6125000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.70 mg/m <sup>3</sup>	<b>DOT:</b> 2417 125			
<b>Synonyms/Trade Names:</b> Carbon difluoride oxide, Carbon fluoride oxide, Carbon oxyfluoride, Carbonyl difluoride, Fluoroformyl fluoride, Fluorophosgene				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (5 mg/m <sup>3</sup> ) ST 5 ppm (15 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a pungent and very irritating odor. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 66.0 BP: -118°F Sol: Reacts Fl.P: NA IP: 13.02 eV RGasD: 2.29 VP: 55.4 atm FRZ: -173°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: N.R. Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
		<b>Incompatibilities and Reactivities:</b> Heat, moisture, hexafluoroisopropylideneamino-lithium [Note: Reacts with water to form hydrogen fluoride & carbon dioxide.]		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, muc memb, resp sys; eye, skin burns; lac; cough, pulm edema, dysp; chronic exposure: GI pain, musc fib, skeletal fluorosis; liquid: frostbite TO: Eyes, skin, resp sys, bone			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Catechol</b>	<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (OH) <sub>2</sub>	<b>CAS#:</b> 120-80-9	<b>RTECS#:</b> UX1050000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.50 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2-Benzenediol; o-Benzenediol; 1,2-Dihydroxybenzene; o-Dihydroxybenzene; 2-Hydroxyphenol; Pyrocatechol				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 ppm (20 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>OSHA PV2014</b>	
<b>Physical Description:</b> Colorless, crystalline solid with a faint odor. [ <b>Note:</b> Discolors to brown in air & light.]				
<b>Chemical &amp; Physical Properties:</b> MW: 110.1 BP: 474°F Sol: 44% Fl.P: 261°F IP: ? Sp.Gr: 1.34 VP(244°F): 10 mmHg MLT: 221°F UEL: ? LEL: 1.4% Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, nitric acid				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; skin sens, derm; lac, burns eyes; convuls, incr BP, kidney inj <b>TO:</b> Eyes, skin, resp sys, CNS, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Cellulose</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>10</sub> O <sub>5</sub> ) <sub>n</sub>	<b>CAS#:</b> 9004-34-6	<b>RTECS#:</b> FJ5691460	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Hydroxycellulose, Pyrocellulose				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 0500, 0600, 7404</b>	
<b>Physical Description:</b> Odorless, white substance. [ <b>Note:</b> The principal fiber cell wall material of vegetable tissues (wood, cotton, flax, grass, etc.)]				
<b>Chemical &amp; Physical Properties:</b> MW: 160,000-560,000 BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 1.27-1.61 VP: 0 mmHg (approx) MLT: 500-518°F (Decomposes) UEL: NA LEL: NA Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Water, bromine pentafluoride, sodium nitrate, fluorine, strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, muc memb <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air	

<b>Cesium hydroxide</b>	<b>Formula:</b> CsOH	<b>CAS#:</b> 21351-79-1	<b>RTECS#:</b> FK9800000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2682 157; 2681 154 (solution)			
<b>Synonyms/Trade Names:</b> Cesium hydrate, Cesium hydroxide dimer				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless or yellowish, crystalline solid. [Note: Hygroscopic (i.e., absorbs moisture from the air).]				
<b>Chemical &amp; Physical Properties:</b> MW: 149.9 BP: ? Sol(59°F): 395% Fl.P: NA IP: NA Sp.Gr: 3.68 VP: 0 mmHg (approx) MLT: 522°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Water, acids, CO <sub>2</sub> , metals (e.g., Al, Pb, Sn, Zn), oxygen [Note: CsOH is a strong base, causing the generation of considerable heat in contact with water or moisture.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; eye, skin burns TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Chlordane</b>	<b>Formula:</b> C <sub>10</sub> H <sub>6</sub> Cl <sub>8</sub>	<b>CAS#:</b> 57-74-9	<b>RTECS#:</b> PB9800000	<b>IDLH:</b> Ca [100 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 2996 151			
<b>Synonyms/Trade Names:</b> Chlordan; Chlordano; 1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.5 mg/m <sup>3</sup> [skin] See Appendix A OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 5510 OSHA 67	
<b>Physical Description:</b> Amber-colored, viscous liquid with a pungent, chlorine-like odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 409.8 BP: Decomposes Sol: 0.0001% Fl.P: NA IP: ? Sp.Gr(77°F): 1.6 VP: 0.00001 mmHg FRZ: 217-228°F UEL: NA LEL: NA Noncombustible Liquid, but may be utilized in flammable solutions.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScaBf:Pd,Pp/SaF:Pd,Pp:AScBa Escape: GmFov100/ScaBE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkaline reagents				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Blurred vision; conf; ataxia, delirium; cough; abdom pain, nau, vomit, diarr; irrity, tremor, convuls; anuria; in animals: lung, liver, kidney damage; [carc] TO: CNS, eyes, lungs, liver, kidneys [in animals: liver cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Chlorinated camphene</b>		<b>Formula:</b> C <sub>10</sub> H <sub>10</sub> Cl <sub>8</sub>	<b>CAS#:</b> 8001-35-2	<b>RTECS#:</b> XW5250000	<b>IDLH:</b> Ca [200 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> Chlorocamphene, Octachlorocamphene, Polychlorocamphene, Toxaphene					
<b>Exposure Limits:</b>		<b>Measurement Methods (see Table 1):</b>			
<b>NIOSH REL:</b> Ca [skin] See Appendix A <b>OSHA PEL†:</b> TWA 0.5 mg/m <sup>3</sup> [skin]		<b>NIOSH 5039</b>			
<b>Physical Description:</b> Amber, waxy solid with a mild, piney, chlorine- and camphor-like odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b>		<b>Personal Protection/Sanitation (see Table 2):</b>		<b>Respirator Recommendations (see Tables 3 and 4):</b>	
<b>MW:</b> 413.8 <b>BP:</b> Decomposes <b>Sol:</b> 0.0003% <b>F.I.P.:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 1.65 <b>VP(77°F):</b> 0.4 mmHg <b>MLT:</b> 149-194°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>NIOSH</b> <b>⚠:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Slightly corrosive to metals under moist conditions.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b>			<b>First Aid (see Table 6):</b>		
<b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Nau, conf, agitation, tremor, convuls, uncon; dry, red skin; [carc] <b>TO:</b> CNS, skin [in animals: liver cancer]			<b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chlorinated diphenyl oxide</b>		<b>Formula:</b> C <sub>12</sub> H <sub>10-n</sub> Cl <sub>n</sub> O	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms depend on the degree of chlorination of diphenyl oxide [(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> O], ranging from monochlorodiphenyl oxide [(C <sub>6</sub> H <sub>4</sub> Cl)O(C <sub>6</sub> H <sub>5</sub> )] to decachlorodiphenyl oxide [(C <sub>6</sub> Cl <sub>5</sub> )O(C <sub>6</sub> Cl <sub>5</sub> )].					
<b>Exposure Limits:</b>		<b>Measurement Methods (see Table 1):</b>			
<b>NIOSH REL:</b> TWA 0.5 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 0.5 mg/m <sup>3</sup>		<b>NIOSH 5025</b>			
<b>Physical Description:</b> Appearance and odor vary depending upon the specific compound.					
<b>Chemical &amp; Physical Properties:</b>		<b>Personal Protection/Sanitation (see Table 2):</b>		<b>Respirator Recommendations (see Tables 3 and 4):</b>	
Properties vary depending upon the specific compound.		<b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> Sa/ScbaF <b>⚠:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOvAg100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b>			<b>First Aid (see Table 6):</b>		
<b>ER:</b> Inh, Ing, Con <b>SY:</b> Acne-form derm, liver damage <b>TO:</b> Skin, liver			<b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chlorine</b>	<b>Formula:</b> Cl <sub>2</sub>	<b>CAS#:</b> 7782-50-5	<b>RTECS#:</b> FO2100000	<b>IDLH:</b> 10 ppm
<b>Conversion:</b> 1 ppm = 2.90 mg/m <sup>3</sup>	<b>DOT:</b> 1017 124			
<b>Synonyms/Trade Names:</b> Molecular chlorine				
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (1.45 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: C 1 ppm (3 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6011 OSHA ID101, ID126SGX	
<b>Physical Description:</b> Greenish-yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 70.9 BP: -29°F Sol: 0.7% Fl.P: NA IP: 11.48 eV RGasD: 2.47 VP: 6.8 atm FRZ: -150°F UEL: NA LEL: NA Nonflammable Gas, but a strong oxidizer.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: N.R. Change: N.R. Provide: Frostbite wash	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 5 ppm: CcrS*/Sa* 10 ppm: Sa:Cf*/PaprS*/CcrFS/GmFS/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Reacts explosively or forms explosive compounds with many common substances such as acetylene, ether, turpentine, ammonia, fuel gas, hydrogen & finely divided metals.				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Burning of eyes, nose, mouth; lac, rhin; cough, choking, subs pain; nau, vomit; head, dizz; syncope; pulm edema; pneu; hypox; derm; liquid: frostbite TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Chlorine dioxide</b>	<b>Formula:</b> ClO <sub>2</sub>	<b>CAS#:</b> 10049-04-4	<b>RTECS#:</b> FO3000000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 2.76 mg/m <sup>3</sup>	<b>DOT:</b> 9191 143 (hydrate, frozen)			
<b>Synonyms/Trade Names:</b> Chlorine oxide, Chlorine peroxide				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.3 mg/m <sup>3</sup> ) ST 0.3 ppm (0.9 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.1 ppm (0.3 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): OSHA ID126SGX, ID202	
<b>Physical Description:</b> Yellow to red gas or a red-brown liquid (below 52°F) with an unpleasant odor similar to chlorine and nitric acid.				
<b>Chemical &amp; Physical Properties:</b> MW: 67.5 BP: 52°F Sol(77°F): 0.3% Fl.P: NA (Gas) ? (Liquid) IP: 10.36 eV RGasD: 2.33 Sp.Gr: 1.6 (Liquid at 32°F) VP: >1 atm FRZ: -74°F UEL: ? LEL: ? Flammable Gas, Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact (liquid) Eyes: Prevent eye contact (liquid) Wash skin: When contam (liquid) Remove: When wet (flamm) Change: N.R. Provide: Eyewash (liquid) Quick drench (liquid)	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1 ppm: CcrS/Sa 2.5 ppm: Sa:Cf/PaprSfE 5 ppm: CcrFS/GmFS/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS <sub>2</sub> /ScbaE		
<b>Incompatibilities and Reactivities:</b> Organic materials, heat, phosphorus, potassium hydroxide, sulfur, mercury, carbon monoxide [Note: Unstable in light. A powerful oxidizer.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing (liquid), Con SY: Irrit eyes, nose, throat; cough, wheez, bron, pulm edema; chronic bron TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed (liquid) Skin: Soap wash immed (liquid) Breath: Resp support Swallow: Medical attention immed (liquid)	

<b>Chlorine trifluoride</b>		<b>Formula:</b> ClF <sub>3</sub>	<b>CAS#:</b> 7790-91-2	<b>RTECS#:</b> FO2800000	<b>IDLH:</b> 20 ppm
<b>Conversion:</b> 1 ppm = 3.78 mg/m <sup>3</sup>		<b>DOT:</b> 1749 124			
<b>Synonyms/Trade Names:</b> Chlorine fluoride, Chlorotrifluoride					
<b>Exposure Limits:</b> NIOSH REL: C 0.1 ppm (0.4 mg/m <sup>3</sup> ) OSHA PEL: C 0.1 ppm (0.4 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless gas or a greenish-yellow liquid (below 53°F) with a somewhat sweet, suffocating odor. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 92.5 BP: 53°F Sol: Reacts F.I.P: NA IP: 13.00 eV RGasD: 3.21 Sp.Gr: 1.77 (Liquid at 53°F) VP: 1.4 atm FRZ: -105°F UEL: NA LEL: NA Nonflammable Gas Noncombustible Liquid, but contact with organic materials may result in SPONTANEOUS ignition.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam (liquid) Remove: When wet or contam (liquid) Change: N.R. Provide: Eyewash (liquid) Quick drench (liquid)		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 2.5 ppm: Sa:CfE 5 ppm: ScbaF/SaF 20 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, water, acids, combustible materials, sand, glass, metals (corrosive) [Note: Reacts with water to form chlorine & hydrofluoric acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing (liquid), Con SY: Eye, skin burns (liq or high vap conc); resp irrit; in animals: lac, corn ulcer; pulm edema TO: Skin, eyes, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed (liquid)		

<b>Chloroacetaldehyde</b>		<b>Formula:</b> ClCH <sub>2</sub> CHO	<b>CAS#:</b> 107-20-0	<b>RTECS#:</b> AB2450000	<b>IDLH:</b> 45 ppm
<b>Conversion:</b> 1 ppm = 3.21 mg/m <sup>3</sup>		<b>DOT:</b> 2232 153			
<b>Synonyms/Trade Names:</b> Chloroacetaldehyde (40% aqueous solution), 2-Chloroacetaldehyde, 2-Chloroethanal					
<b>Exposure Limits:</b> NIOSH REL: C 1 ppm (3 mg/m <sup>3</sup> ) OSHA PEL: C 1 ppm (3 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 2015 OSHA 76	
<b>Physical Description:</b> Colorless liquid with an acrid, penetrating odor. [Note: Typically found as a 40% aqueous solution.]					
<b>Chemical &amp; Physical Properties:</b> MW: 78.5 BP: 186°F Sol: Miscible F.I.P: 40% solution IP: 10.61 eV Sp.Gr: 1.19 (40% solution) VP: 100 mmHg FRZ: -3°F (40% solution) UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 10 ppm: CcrOv*/Sa* 25 ppm: Sa:Cf*/PaprvOv* 45 ppm: CcrFOv/GmFOv/PaprvTOv/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit skin, eyes, muc memb; skin burns; eye damage; pulm edema; skin, resp sys sens TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b><math>\alpha</math>-Chloroacetophenone</b>		<b>Formula:</b> C <sub>8</sub> H <sub>7</sub> COCH <sub>2</sub> Cl	<b>CAS#:</b> 532-27-4	<b>RTECS#:</b> AM6300000	<b>IDLH:</b> 15 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 6.32 mg/m <sup>3</sup>		<b>DOT:</b> 1697 153			
<b>Synonyms/Trade Names:</b> 2-Chloroacetophenone, Chloromethyl phenyl ketone, Mace®, Phenacyl chloride, Phenyl chloromethyl ketone, Tear gas					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.3 mg/m <sup>3</sup> (0.05 ppm) OSHA PEL: TWA 0.3 mg/m <sup>3</sup> (0.05 ppm)				<b>Measurement Methods</b> (see Table 1): NIOSH P&CAM291 (II-5)	
<b>Physical Description:</b> Colorless to gray crystalline solid with a sharp, irritating odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 154.6 BP: 472°F Sol: Insoluble Fl.P: 244°F IP: 9.44 eV Sp.Gr: 1.32 VP: 0.005 mmHg MLT: 134°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> 3 mg/m <sup>3</sup> : CcrOv95/Sa 7.5 mg/m <sup>3</sup> : Sa:CfE/Pap/OvHief 15 mg/m <sup>3</sup> : CcrFov100/GmFS100/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Water, steam, strong oxidizers [Note: Slowly corrodes metals.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; pulm edema TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chloroacetyl chloride</b>		<b>Formula:</b> ClCH <sub>2</sub> COCl	<b>CAS#:</b> 79-04-9	<b>RTECS#:</b> AO6475000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.62 mg/m <sup>3</sup>		<b>DOT:</b> 1752 156			
<b>Synonyms/Trade Names:</b> Chloroacetic acid chloride, Chloroacetic chloride, Monochloroacetyl chloride					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 ppm (0.2 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to yellowish liquid with a strong, pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 112.9 BP: 223°F Sol: Decomposes Fl.P: NA IP: 10.30 eV Sp.Gr: 1.42 VP: 19 mmHg FRZ: -7°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water, alcohols, bases, metals (corrosive), amines [Note: Decomposes in water to form chloroacetic acid & hydrogen chloride gas.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; cough, wheez, dysp; lac TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chlorobenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> Cl	<b>CAS#:</b> 108-90-7	<b>RTECS#:</b> CZ0175000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 4.61 mg/m <sup>3</sup>		<b>DOT:</b> 1134 130			
<b>Synonyms/Trade Names:</b> Benzene chloride, Chlorobenzol, MCB, Monochlorobenzene, Phenyl chloride					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL: TWA 75 ppm (350 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless liquid with an almond-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 112.6 BP: 270°F Sol: 0.05% F.I.P.: 82°F IP: 9.07 eV Sp.Gr: 1.11 VP: 9 mmHg FRZ: -50°F UEL: 9.6% LEL: 1.3% Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>1000 ppm:</b> Sa:Cf£/PapOv£/CcrFOv/ GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; drow, inco; CNS depres; in animals: liver, lung, kidney inj TO: Eyes, skin, resp sys, CNS, liver			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Chlorobenzylidene malonitrile</b>		<b>Formula:</b> C <sub>10</sub> H <sub>7</sub> CH=C(CN) <sub>2</sub>	<b>CAS#:</b> 2698-41-1	<b>RTECS#:</b> OO3675000	<b>IDLH:</b> 2 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 7.71 mg/m <sup>3</sup>		<b>DOT:</b> 2810 153			
<b>Synonyms/Trade Names:</b> 2-Chlorobenzalmonitrile, CS, OCBM					
<b>Exposure Limits:</b> NIOSH REL: C 0.05 ppm (0.4 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 0.05 ppm (0.4 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH P&CAM304 (II-5)	
<b>Physical Description:</b> White crystalline solid with a pepper-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 188.6 BP: 590-599°F Sol: Insoluble F.I.P.: ? IP: ? Sp.Gr: ? VP: 0.00003 mmHg MLT: 203-205°F UEL: ? LEL: ? MEC: 25 g/m <sup>3</sup> Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2 mg/m<sup>3</sup>:</b> Sa:Cf£/GmFS100/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Pain, burn eyes, lac, conj; eryt eyelids, blepharospasm; irrit throat, cough, chest tight; head; eryt, vesic skin TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chlorobromomethane</b>	<b>Formula:</b> CH <sub>2</sub> BrCl	<b>CAS#:</b> 74-97-5	<b>RTECS#:</b> PA5250000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 5.29 mg/m <sup>3</sup>		<b>DOT:</b> 1887 160		
<b>Synonyms/Trade Names:</b> Bromochloromethane, CB, CBM, Fluorocarbon 1011, Halon® 1011, Methyl chlorobromide				
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (1050 mg/m <sup>3</sup> ) OSHA PEL: TWA 200 ppm (1050 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1003	
<b>Physical Description:</b> Colorless to pale-yellow liquid with a chloroform-like odor. [Note: May be used as a fire extinguishing agent.]				
<b>Chemical &amp; Physical Properties:</b> MW: 129.4 BP: 155°F Sol: Insoluble F.I.P: NA IP: 10.77 eV Sp.Gr: 1.93 VP: 115 mmHg FRZ: -124°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 2000 ppm: Sa:CfE/PaprOvE/CcrFOv/ GmFOv/ScbaF/SaF S: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as calcium, powdered aluminum, zinc, and magnesium				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, throat; conf, dizz, CNS depres; pulm edema TO: Eyes, skin, resp sys, liver, kidneys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Chlorodifluoromethane</b>	<b>Formula:</b> CHClF <sub>2</sub>	<b>CAS#:</b> 75-45-6	<b>RTECS#:</b> PA6390000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.54 mg/m <sup>3</sup>		<b>DOT:</b> 1018 126		
<b>Synonyms/Trade Names:</b> Difluorochloromethane, Fluorocarbon-22, Freon® 22, Genetron® 22, Monochlorodifluoromethane, Refrigerant 22				
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (3500 mg/m <sup>3</sup> ) ST 1250 ppm (4375 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 1018	
<b>Physical Description:</b> Colorless gas with a faint, sweetish odor. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 86.5 BP: -41°F Sol(77°F): 0.3% F.I.P: NA IP: 12.45 eV RGasD: 3.11 VP: 9.4 atm FRZ: -231°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: N.R. Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis, alkaline earth metals (e.g., powdered aluminum, sodium, potassium, zinc)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Irrit resp sys; conf, drow, ringing in ears; heart palp, card arrhy; asphy; liver, kidney, spleen inj; liquid: frostbite TO: Resp sys, CVS, CNS, liver, kidneys, spleen			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Chlorodiphenyl (42% chlorine)</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> ClC <sub>6</sub> H <sub>3</sub> Cl <sub>2</sub> (approx)	<b>CAS#:</b> 53469-21-9	<b>RTECS#:</b> TQ1356000	<b>IDLH:</b> Ca [5 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b> 2315 171			
<b>Synonyms/Trade Names:</b> Aroclor® 1242, PCB, Polychlorinated biphenyl					
<b>Exposure Limits:</b> NIOSH REL*: Ca TWA 0.001 mg/m <sup>3</sup> See Appendix A [*Note: The REL also applies to other PCBs.]			OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]		<b>Measurement Methods</b> (see Table 1): NIOSH 5503 OSHA PV2089
<b>Physical Description:</b> Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 258 (approx) BP: 617-691°F Sol: Insoluble F.I.P: NA IP: ? Sp.Gr(77°F): 1.39 VP: 0.001 mmHg FRZ: -2°F UEL: NA LEL: NA		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins.					
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes; chloracne; liver damage; repro effects; [carc] TO: Skin, eyes, liver, repro sys [in animals: tumors of the pituitary gland & liver, leukemia]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Chlorodiphenyl (54% chlorine)</b>		<b>Formula:</b> C <sub>6</sub> H <sub>3</sub> Cl <sub>2</sub> C <sub>6</sub> H <sub>2</sub> Cl <sub>3</sub> (approx)	<b>CAS#:</b> 11097-69-1	<b>RTECS#:</b> TQ1360000	<b>IDLH:</b> Ca [5 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b> 2315 171			
<b>Synonyms/Trade Names:</b> Aroclor® 1254, PCB, Polychlorinated biphenyl					
<b>Exposure Limits:</b> NIOSH REL*: Ca TWA 0.001 mg/m <sup>3</sup> See Appendix A [*Note: The REL also applies to other PCBs.]			OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]		<b>Measurement Methods</b> (see Table 1): NIOSH 5503 OSHA PV2088
<b>Physical Description:</b> Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 326 (approx) BP: 689-734°F Sol: Insoluble F.I.P: NA IP: ? Sp.Gr(77°F): 1.38 VP: 0.00006 mmHg FRZ: 50°F UEL: NA LEL: NA		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.					
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, chloracne; liver damage; repro effects; [carc] TO: Skin, eyes, liver, repro sys [in animals: tumors of the pituitary gland & liver, leukemia]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Chloroform</b>	<b>Formula:</b> CHCl <sub>3</sub>	<b>CAS#:</b> 67-66-3	<b>RTECS#:</b> FS9100000	<b>IDLH:</b> Ca [500 ppm]
<b>Conversion:</b> 1 ppm = 4.88 mg/m <sup>3</sup>		<b>DOT:</b> 1888 151		
<b>Synonyms/Trade Names:</b> Methane trichloride, Trichloromethane				
<b>Exposure Limits:</b> NIOSH REL: Ca ST 2 ppm (9.78 mg/m <sup>3</sup> ) [60-minute] See Appendix A OSHA PEL†: C 50 ppm (240 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1003	
<b>Physical Description:</b> Colorless liquid with a pleasant odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 119.4 BP: 143°F Sol(77°F): 0.5% Fl.P: NA IP: 11.42 eV Sp.Gr: 1.48 VP: 160 mmHg FRZ: -82°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF: Pd, Pp/ SaF: Pd, Pp/ AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong caustics; chemically-active metals such as aluminum or magnesium powder, sodium & potassium; strong oxidizers [Note: When heated to decomposition, forms phosgene gas.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; dizz, mental dullness, nau, conf; head, lass; anes; enlarged liver; [carc] TO: Liver, kidneys, heart, eyes, skin, CNS [in animals: liver & kidney cancer]			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>bis-Chloromethyl ether</b>	<b>Formula:</b> (CH <sub>2</sub> Cl) <sub>2</sub> O	<b>CAS#:</b> 542-88-1	<b>RTECS#:</b> KN1575000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 2249 131		
<b>Synonyms/Trade Names:</b> BCME, bis-CME, Chloromethyl ether, Dichlorodimethyl ether, Dichloromethyl ether, Oxybis(chloromethane)				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A			<b>Measurement Methods</b> (see Table 1): OSHA 10	
<b>OSHA PEL:</b> [1910.1008] See Appendix B		<b>Physical Description:</b> Colorless liquid with a suffocating odor.		
<b>Chemical &amp; Physical Properties:</b> MW: 115.0 BP: 223°F Sol: Reacts Fl.P: <66°F IP: ? Sp.Gr: 1.32 VP(72°F): 30 mmHg FRZ: -43°F UEL: ? LEL: ? Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet (flamm) Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF: Pd, Pp/ SaF: Pd, Pp/ AScba Escape: GmFOv/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Acids, water [Note: Reacts with water to form hydrochloric acid & formaldehyde.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb, resp sys; pulm congestion, edema; corn damage, nec; decr pulm function, cough, dysp, wheez; blood-stained sputum, bronchial secretions; [carc] TO: Eyes, skin, resp sys [lung cancer]			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Chloromethyl methyl ether</b>		<b>Formula:</b> CH <sub>2</sub> OCH <sub>2</sub> Cl	<b>CAS#:</b> 107-30-2	<b>RTECS#:</b> KN6650000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 1239 131			
<b>Synonyms/Trade Names:</b> Chlorodimethyl ether, Chloromethoxymethane, CMME, Dimethylchloroether, Methylchloromethyl ether					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL:</b> [1910.1006] See Appendix B				<b>Measurement Methods (see Table 1):</b> <b>NIOSH P&amp;CAM220 (II-1)</b> <b>OSHA 10</b>	
<b>Physical Description:</b> Colorless liquid with an irritating odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 80.5 <b>BP:</b> 138°F <b>Sol:</b> Reacts <b>Fl.P(oc):</b> 32°F <b>IP:</b> 10.25 eV <b>Sp.Gr:</b> 1.06 <b>VP(70°F):</b> 192 mmHg <b>FRZ:</b> -154°F <b>UEL:</b> ? <b>LEL:</b> ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet (flamm) <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE  <b>See Appendix E</b> (page 351)	
<b>Incompatibilities and Reactivities:</b> Water [Note: Reacts with water to form hydrochloric acid & formaldehyde.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; pulm edema, pulm congestion, pneu; skin burns, nec; cough, wheez, pulm congestion; blood stained-sputum; low-wgt; bronchial secretions; [carc] <b>TO:</b> Eyes, skin, resp sys [in animals: skin & lung cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1-Chloro-1-nitropropane</b>		<b>Formula:</b> CH <sub>2</sub> CH <sub>2</sub> CHClNO <sub>2</sub>	<b>CAS#:</b> 600-25-9	<b>RTECS#:</b> TX5075000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 5.06 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Korax®, Lanstan®					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (10 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 20 ppm (100 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH S211 (II-5)</b>	
<b>Physical Description:</b> Colorless liquid with an unpleasant odor. [fungicide]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 123.6 <b>BP:</b> 289°F <b>Sol:</b> 0.5% <b>Fl.P(oc):</b> 144°F <b>IP:</b> 9.90 eV <b>Sp.Gr:</b> 1.21 <b>VP(77°F):</b> 6 mmHg <b>FRZ:</b> ? <b>UEL:</b> ? <b>LEL:</b> ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>20 ppm:</b> Sa* <b>50 ppm:</b> Sa:Cf*/Paprov* <b>100 ppm:</b> CcrFOv/GmFOv/Paprov*/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> In animals: irrit eyes; pulm edema; liver, kidney, heart damage <b>TO:</b> Resp sys, liver, kidneys, CVS, eyes				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Chloropentafluoroethane</b>	<b>Formula:</b> CClF <sub>2</sub> CF <sub>3</sub>	<b>CAS#:</b> 76-15-3	<b>RTECS#:</b> KH7877500	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.32 mg/m <sup>3</sup>	<b>DOT:</b> 1020 126			
<b>Synonyms/Trade Names:</b> Fluorocarbon-115, Freon® 115, Genetron® 115, Halocarbon 115, Monochloropentafluoroethane				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1000 ppm (6320 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> <b>(see Table 1):</b> None available	
<b>Physical Description:</b> Colorless gas with a slight, ethereal odor. <b>[Note:</b> Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 154.5 BP: -38°F Sol(77°F): 0.006% Fl.P: NA IP: 12.96 eV RGasD: 5.55 VP(70°F): 7.9 atm FRZ: -223°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis, alkaline earth metals (e.g., aluminum powder, sodium, potassium, zinc)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Dysp, dizz, inco, narco; nau, vomit; heart palp, card arrhy, asphy; liquid: frostbite, derm <b>TO:</b> Skin, CNS, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Chloropicrin</b>	<b>Formula:</b> CCl <sub>3</sub> NO <sub>2</sub>	<b>CAS#:</b> 76-06-2	<b>RTECS#:</b> PB6300000	<b>IDLH:</b> 2 ppm
<b>Conversion:</b> 1 ppm = 6.72 mg/m <sup>3</sup>	<b>DOT:</b> 1580 154; 1583 154 (mixture, n.o.s.)			
<b>Synonyms/Trade Names:</b> Nitrochloroform, Nitrotrichloromethane, Trichloronitromethane				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.7 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 0.1 ppm (0.7 mg/m <sup>3</sup> )			<b>Measurement Methods</b> <b>(see Table 1):</b> None available	
<b>Physical Description:</b> Colorless to faint-yellow, oily liquid with an intensely irritating odor. [pesticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 164.4 BP: 234°F Sol: 0.2% Fl.P: NA IP: ? Sp.Gr: 1.66 VP: 18 mmHg FRZ: -93°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2 ppm:</b> Sa:CfE/PapRovE/CcrFOv/ GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers <b>[Note:</b> The material may explode when heated under confinement.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; lac; cough, pulm edema; nau, vomit <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>β-Chloroprene</b>		<b>Formula:</b> CH <sub>2</sub> =CClCH=CH <sub>2</sub>	<b>CAS#:</b> 126-99-8	<b>RTECS#:</b> E19625000	<b>IDLH:</b> Ca [300 ppm]
<b>Conversion:</b> 1 ppm = 3.62 mg/m <sup>3</sup>		<b>DOT:</b> 1991 131P (inhibited)			
<b>Synonyms/Trade Names:</b> 2-Chloro-1,3-butadiene; Chlorobutadiene; Chloroprene					
<b>Exposure Limits:</b> NIOSH REL: Ca C 1 ppm (3.6 mg/m <sup>3</sup> ) [15-minute] See Appendix A OSHA PEL†: TWA 25 ppm (90 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 1002 OSHA 112	
<b>Physical Description:</b> Colorless liquid with a pungent, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 88.5 BP: 139°F Sol: Slight F.L.P: -4°F IP: 8.79 eV Sp.Gr: 0.96 VP: 188 mmHg FRZ: -153°F UEL: 11.3% LEL: 1.9% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF;Pd,Pp/SaF:Pd,Pp;AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Peroxides & other oxidizers [Note: Polymerizes at room temperature unless inhibited with antioxidants.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; anxi, irrity; derm; alopecia; repro effects; [carc] TO: Eyes, skin, resp sys, repro sys [lung & skin cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Chlorostyrene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> CH=CH <sub>2</sub>	<b>CAS#:</b> 2039-87-4	<b>RTECS#:</b> WL4160000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.67 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-Chlorostyrene, ortho-Chlorostyrene, 1-Chloro-2-ethenylbenzene					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (285 mg/m <sup>3</sup> ) ST 75 ppm (428 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid.					
<b>Chemical &amp; Physical Properties:</b> MW: 138.6 BP: 372°F Sol: Insoluble F.L.P: 138°F IP: ? Sp.Gr: 1.10 VP(77°F): 0.96 mmHg FRZ: -82°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, skin; hema, prot, acidosis; enlarged liver, jaun TO: Eyes, skin, liver, kidneys, CNS, PNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Chlorotoluene</b>		<b>Formula:</b> ClC <sub>6</sub> H <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 95-49-8	<b>RTECS#:</b> XS9000000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.18 mg/m <sup>3</sup>		<b>DOT:</b> 2238 129			
<b>Synonyms/Trade Names:</b> 1-Chloro-2-methylbenzene, 2-Chloro-1-methylbenzene, 2-Chlorotoluene, o-Tolyl chloride					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 50 ppm (250 mg/m <sup>3</sup> ) ST 75 ppm (375 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none				<b>Measurement Methods</b> <b>(see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 126.6 <b>BP:</b> 320°F <b>Sol(77°F):</b> 0.009% <b>Fl.P:</b> 96°F <b>IP:</b> 8.83 eV <b>Sp.Gr:</b> 1.08 <b>VP(77°F):</b> 4 mmHg <b>FRZ:</b> -31°F <b>UEL:</b> ? <b>LEL:</b> ? Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Acids, alkalis, oxidizers, reducing materials, water					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; derm; drow, inco, anes; cough; liver, kidney inj <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>2-Chloro-6-trichloromethyl pyridine</b>		<b>Formula:</b> ClC <sub>2</sub> H <sub>3</sub> NCCl <sub>3</sub>	<b>CAS#:</b> 1929-82-4	<b>RTECS#:</b> US7525000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-Chloro-6-(trichloro-methyl)pyridine; Nitrapyrin; N-serve®; 2,2,2,6-Tetrachloro-2-picoline					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) ST 20 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods</b> <b>(see Table 1):</b> None available	
<b>Physical Description:</b> Colorless or white, crystalline solid with a mild, sweet odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 230.9 <b>BP:</b> ? <b>Sol:</b> Insoluble <b>Fl.P:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> ? <b>VP(73°F):</b> 0.003 mmHg <b>MLT:</b> 145°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid [Explosive]		<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Aluminum, magnesium <b>[Note:</b> Emits oxides of nitrogen and chloride ion when heated to decomposition.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> No adverse effects noted in ingestion studies with animals. <b>TO:</b> Eyes, skin			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chlorpyrifos</b>	<b>Formula:</b> C <sub>9</sub> H <sub>11</sub> Cl <sub>3</sub> NO <sub>3</sub> PS	<b>CAS#:</b> 2921-88-2	<b>RTECS#:</b> TF6300000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> Chlorpyrifos-ethyl; O, O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate; Dursban®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 mg/m <sup>3</sup> ST 0.6 mg/m <sup>3</sup> [skin]	<b>OSHA PEL†:</b> none		<b>Measurement Methods</b> (see Table 1): NIOSH 5600      OSHA 62	
<b>Physical Description:</b> Colorless to white, crystalline solid with a mild, mercaptan-like odor. [pesticide] [Note: Commercial formulations may be combined with combustible liquids.]				
<b>Chemical &amp; Physical Properties:</b> MW: 350.6 BP: 320°F (Decomposes) Sol: 0.0002% F.I.P.: ? IP: ? Sp.Gr: 1.40 (Liquid at 110°F) VP: 0.00002 mmHg MLT: 108°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
	<b>Incompatibilities and Reactivities:</b> Strong acids, caustics, amines [Note: Corrosive to copper & brass.]			
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Wheez, lar spasms, saliv; bluish lips, skin; miosis, blurred vision; nau, vomit, abdom cramps, diarr TO: Resp sys, CNS, PNS, plasma chol		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chromic acid and chromates</b>	<b>Formula:</b> CrO <sub>3</sub> (acid)	<b>CAS#:</b> 1333-82-0 (CrO <sub>3</sub> )	<b>RTECS#:</b> GB6650000 (CrO <sub>3</sub> )	<b>IDLH:</b> Ca [15 mg/m <sup>3</sup> {as Cr(VI)}]
<b>Conversion:</b>	<b>DOT:</b> 1755 154 (acid solution); 1463 141 (acid, solid)			
<b>Synonyms/Trade Names:</b> Chromic acid (CrO <sub>3</sub> ): Chromic anhydride, Chromic oxide, Chromium(VI) oxide (1:3), Chromium trioxide. Synonyms of chromates (i.e., chromium(VI) compounds) such as zinc chromate vary depending upon the specific compound.				
<b>Exposure Limits:</b> NIOSH REL (as Cr): Ca TWA 0.001 mg/m <sup>3</sup> See Appendix A See Appendix C OSHA PEL (as CrO <sub>3</sub> ): C 0.1 mg/m <sup>3</sup> See Appendix C			<b>Measurement Methods</b> (see Table 1): NIOSH 7600, 7604, 7605 OSHA ID103, ID215, W4001	
<b>Physical Description:</b> CrO <sub>3</sub> : Dark-red, odorless flakes or powder. [Note: Often used in an aqueous solution (H <sub>2</sub> CrO <sub>4</sub> ).]				
<b>Chemical &amp; Physical Properties:</b> MW: 100.0 BP: 482°F (Decomposes) Sol: 63% F.I.P.: NA IP: NA Sp.Gr: 2.70 (CrO <sub>3</sub> ) VP: Very low MLT: 387°F (Decomposes) UEL: NA LEL: NA CrO <sub>3</sub> : Noncombustible Solid, but will accelerate the burning of combustible materials.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Combustible, organic, or other readily oxidizable materials (paper, wood, sulfur, aluminum, plastics, etc.); corrosive to metals			
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit resp sys; nasal septum perf; liver, kidney damage; leucity, leupen, eosin; eye inj, conj; skin ulcer, sens derm; [carc] TO: Blood, resp sys, liver, kidneys, eyes, skin [lung cancer]		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chromium(II) compounds (as Cr)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 250 mg/m <sup>3</sup> [as Cr(II)]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific Chromium(II) compound. [Note: Chromium(II) compounds include soluble chromous salts.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 mg/m <sup>3</sup> See Appendix C <b>OSHA PEL:</b> TWA 0.5 mg/m <sup>3</sup> See Appendix C			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 7024, 7300, 7301, 7303, 9102 <b>OSHA</b> ID121, ID125G		
<b>Physical Description:</b> Appearance and odor vary depending upon the specific compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific compound.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2.5 mg/m<sup>3</sup>:</b> Qm* <b>5 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>12.5 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie* <b>25 mg/m<sup>3</sup>:</b> 100F/PaprTHie*/ScbaF/SaF <b>250 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes; sens derm <b>TO:</b> Eyes, skin			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chromium(III) compounds (as Cr)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 25 mg/m <sup>3</sup> [as Cr(III)]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific Chromium(III) compound. [Note: Chromium(III) compounds include soluble chromic salts.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 mg/m <sup>3</sup> See Appendix C <b>OSHA PEL:</b> TWA 0.5 mg/m <sup>3</sup> See Appendix C			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 7024, 7300, 7301, 7303, 9102 <b>OSHA</b> ID121, ID125G		
<b>Physical Description:</b> Appearance and odor vary depending upon the specific compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific compound.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2.5 mg/m<sup>3</sup>:</b> Qm* <b>5 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>12.5 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie* <b>25 mg/m<sup>3</sup>:</b> 100F/PaprTHie*/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes; sens derm <b>TO:</b> Eyes, skin			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Chromium metal</b>	<b>Formula:</b> Cr	<b>CAS#:</b> 7440-47-3	<b>RTECS#:</b> GB4200000	<b>IDLH:</b> 250 mg/m <sup>3</sup> (as Cr)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Chrome, Chromium				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> See Appendix C OSHA PEL*: TWA 1 mg/m <sup>3</sup> See Appendix C [*Note: The PEL also applies to insoluble chromium salts.]			<b>Measurement Methods (see Table 1):</b> NIOSH 7024, 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
<b>Physical Description:</b> Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 52.0 BP: 4788°F Sol: Insoluble F.L.P.: NA IP: NA Sp.Gr: 7.14 VP: 0 mmHg (approx) MLT: 3452°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but finely divided dust burns rapidly if heated in a flame.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 2.5 mg/m <sup>3</sup> : Qm* 5 mg/m <sup>3</sup> : 95XQ*/Sa* 12.5 mg/m <sup>3</sup> : Sa:C*/PaprHie* 25 mg/m <sup>3</sup> : 100F/PaprThie*/ScbaF/SaF 250 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; lung fib (histologic) TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as hydrogen peroxide), alkalis				

<b>Chromyl chloride</b>	<b>Formula:</b> Cr(OCl) <sub>2</sub>	<b>CAS#:</b> 14977-61-8	<b>RTECS#:</b> GB5775000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b> 1758 137			
<b>Synonyms/Trade Names:</b> Chlorochromic anhydride, Chromic oxychloride, Chromium chloride oxide, Chromium dichloride dioxide, Chromium dioxide dichloride, Chromium dioxychloride, Chromium oxychloride, Dichlorodioxochromium				
<b>Exposure Limits:</b> NIOSH REL: Ca 0.001 mg Cr(VI)/m <sup>3</sup> See Appendix A, See Appendix C			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Deep-red liquid with a musty, burning, acrid odor. [Note: Fumes in moist air.]				
<b>Chemical &amp; Physical Properties:</b> MW: 154.9 BP: 243°F Sol: Reacts F.L.P.: NA IP: 12.60 eV Sp.Gr(77°F): 1.91 VP: 20 mmHg FRZ: -142°F UEL: NA LEL: NA Noncombustible Liquid, but a powerful oxidizer.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV/ScbaE
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys; eye, skin burns [carc] TO: Eyes, skin, resp sys [lung cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	
<b>Incompatibilities and Reactivities:</b> Water, combustible substances, halides, phosphorus, turpentine [Note: Reacts violently in water; forms chromic acid, chromic chloride, hydrochloric acid & chlorine. Corrodes common metals.]				

<b>Clopidol</b>	<b>Formula:</b> C <sub>7</sub> H <sub>7</sub> Cl <sub>2</sub> NO	<b>CAS#:</b> 2971-90-6	<b>RTECS#:</b> UU7711500	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Coyden®; 3,5-Dichloro-2,6-dimethyl-4-pyridinol				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) ST 20 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> White to light-brown, crystalline solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 192.1 BP: ? Sol: Insoluble Fl.P: NA IP: ? Sp.Gr: ? VP: ? MLT: >608°F UEL: NA LEL: NA Noncombustible Solid, but dust may explode in cloud form.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, nose, throat; cough TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air	

<b>Coal dust</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> GF8281000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 1361 133			
<b>Synonyms/Trade Names:</b> Anthracite coal dust, Bituminous coal dust, Lignite coal dust				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 2.4 mg/m <sup>3</sup> [respirable, <5% SiO <sub>2</sub> ] TWA (10 mg/m <sup>3</sup> )/(%SiO <sub>2</sub> + 2) [respirable, ≥ 5% SiO <sub>2</sub> ] See Appendix C (Mineral Dusts)			<b>Measurement Methods</b> (see Table 1): NIOSH 0600, 7500	
<b>Physical Description:</b> Dark-brown to black solid dispersed in air.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific coal type.  Combustible Solid; slightly explosive when exposed to flame.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Chronic bron, decr pulm func, emphy TO: Resp sys			<b>First Aid (see Table 6):</b> Breath: Fresh air	

<b>Coal tar pitch volatiles</b>		<b>Formula:</b>	<b>CAS#:</b> 65996-93-2	<b>RTECS#:</b> GF8655000	<b>IDLH:</b> Ca [80 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b> 2713 153 (acridine)			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific compound (e.g., pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a)pyrene). [ <b>Note:</b> NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 0.1 mg/m <sup>3</sup> (cyclohexane-extractable fraction) See Appendix A See Appendix C <b>OSHA PEL:</b> TWA 0.2 mg/m <sup>3</sup> (benzene-soluble fraction) [1910.1002] See Appendix C				<b>Measurement Methods (see Table 1):</b> <b>OSHA 58</b>	
<b>Physical Description:</b> Black or dark-brown amorphous residue.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific compound. Combustible Solids		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF;Pd,Pp/SaF;Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Derm, bron, [carc] <b>TO:</b> Resp sys, skin, bladder, kidneys [lung, kidney & skin cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Cobalt carbonyl (as Co)</b>		<b>Formula:</b> C <sub>5</sub> Co <sub>2</sub> O <sub>8</sub>	<b>CAS#:</b> 10210-68-1	<b>RTECS#:</b> GG0300000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> di-mu-Carbonylhexacarbonyldicobalt, Cobalt octacarbonyl, Cobalt tetracarbonyl dimer, Dicobalt carbonyl, Dicobalt Octacarbonyl, Octacarbonyldicobalt					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Orange to dark-brown, crystalline solid. [ <b>Note:</b> The pure substance is white.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 341.9 <b>BP:</b> 126°F (Decomposes) <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 1.87 <b>VP:</b> 0.7 mmHg <b>MLT:</b> 124°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but flammable carbon monoxide is emitted during decomposition.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Air [ <b>Note:</b> Decomposes on exposure to air or heat; stable in atmosphere of hydrogen & carbon monoxide.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; cough, decr pulm func, wheez, dysp; in animals: liver, kidney inj, pulm edema <b>TO:</b> Eyes, skin, resp sys, blood, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Cobalt hydrocarbonyl (as Co)</b>	<b>Formula:</b> HCo(CO) <sub>4</sub>	<b>CAS#:</b> 16842-03-8	<b>RTECS#:</b> GG0900000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Hydrocobalt tetracarbonyl, Tetracarbonylhydridocobalt, Tetracarbonylhydrocobalt				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Gas with an offensive odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 172.0 BP: ? Sol: 0.05% Fl.P: NA (Gas) IP: ? RGasD: 5.93 VP: >1 atm FRZ: -15°F UEL: ? LEL: ? Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Air [Note: Unstable gas that decomposes rapidly in air at room temperature to cobalt carbonyl & hydrogen.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: In animals: irrit resp sys; dysp, cough, decr pulm func, pulm edema TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support	

<b>Cobalt metal dust and fume (as Co)</b>	<b>Formula:</b> Co	<b>CAS#:</b> 7440-48-4	<b>RTECS#:</b> GF8750000	<b>IDLH:</b> 20 mg/m <sup>3</sup> (as Co)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cobalt metal dust, Cobalt metal fume				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 mg/m <sup>3</sup> OSHA PEL†: TWA 0.1 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 7027, 7300, 7301, 7303, 9102 OSHA ID121, ID125G, ID213	
<b>Physical Description:</b> Odorless, silver-gray to black solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 58.9 BP: 5612°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 8.92 VP: 0 mmHg (approx) MLT: 2719°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but finely divided dust will burn at high temperatures.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 0.25 mg/m <sup>3</sup> : Qm 0.5 mg/m <sup>3</sup> : 95XQ*/Sa* 1.25 mg/m <sup>3</sup> : Sa:C*/PaprHie* 2.5 mg/m <sup>3</sup> : 100F/ScbaF/SaF 20 mg/m <sup>3</sup> : SaF: Pd, Pp ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, ammonium nitrate				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Cough, dysp, wheez, decr pulm func; low-wgt; dermat; diffuse nodular fib; resp hypersensitivity, asthma TO: Skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

Coke oven emissions		Formula:	CAS#:	RTECS#:	IDLH:
Conversion:		DOT:			
Synonyms/Trade Names: Synonyms vary depending upon the specific constituent.					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 0.2 mg/m <sup>3</sup> (benzene-soluble fraction) See Appendix A See Appendix C <b>OSHA PEL:</b> [1910.1029] TWA 0.150 mg/m <sup>3</sup> (benzene-soluble fraction)		<b>Measurement Methods (see Table 1):</b> <b>OSHA 58</b>			
<b>Physical Description:</b> Emissions released during the carbonization of bituminous coal for the production of coke. [Note: See Appendix C for more information.]		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ✕: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE  <b>See Appendix E (page 351)</b>	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, resp sys; cough, dysp, wheez; [carc] <b>TO:</b> Skin, resp sys, urinary sys [skin, lung, kidney & bladder cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Resp support	

Copper (dusts and mists, as Cu)		Formula:	CAS#:	RTECS#:	IDLH:
Conversion:		DOT:			
Synonyms/Trade Names: Copper metal dusts, Copper metal fumes					
<b>Exposure Limits:</b> <b>NIOSH REL*:</b> TWA 1 mg/m <sup>3</sup> <b>OSHA PEL*:</b> TWA 1 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other copper compounds (as Cu) except copper fume.]		<b>Measurement Methods (see Table 1):</b> <b>NIOSH 7029, 7300, 7301, 7303, 9102</b> <b>OSHA ID121, ID125G</b>			
<b>Physical Description:</b> Reddish, lustrous, malleable, odorless solid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 63.5 <b>BP:</b> 4703°F <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 8.94 <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 1981°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid in bulk form, but powdered form may ignite.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> Qm* <b>10 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>25 mg/m<sup>3</sup>:</b> Sa:Cf*/PaprHie* <b>50 mg/m<sup>3</sup>:</b> 100F/PaprTHie*/ScbaF/SaF <b>100 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, alkalis, sodium azide, acetylene					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, nose, pharynx; nasal septum perf; metallic taste; dermat; in animals: lung, liver, kidney damage; anemia <b>TO:</b> Eyes, skin, resp sys, liver, kidneys (incr risk with Wilson's disease)				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Copper fume (as Cu)</b>		<b>Formula:</b> CuO/Cu	<b>CAS#:</b> 1317-38-0 (CuO)	<b>RTECS#:</b> GL7900000 (CuO)	<b>IDLH:</b> 100 mg/m <sup>3</sup> (as Cu)
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cu: Copper fume CuO: Black copper oxide fume, Copper monoxide fume, Copper(II) oxide fume, Cupric oxide fume [ <b>Note:</b> Also see specific listing for Copper (dusts and mists).]					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> OSHA PEL: TWA 0.1 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): NIOSH 7029, 7300, 7301, 7303 OSHA ID121, ID125G, ID206	
<b>Physical Description:</b> Finely divided black particulate dispersed in air. [ <b>Note:</b> Exposure may occur in copper & brass plants and during the welding of copper alloys.]					
<b>Chemical &amp; Physical Properties:</b> MW: 79.5 BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 6.4 (CuO) VP: 0 mmHg (approx) MLT: 1879°F (Decomposes) UEL: NA LEL: NA CuO: Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1 mg/m <sup>3</sup> : 95XQ/Sa 2.5 mg/m <sup>3</sup> : Sa:Cf/PaprHie 5 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 100 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> CuO: Acetylene, zirconium [ <b>Note:</b> See Copper (dusts and mists) for properties of Copper metal.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, upper resp sys; metal fume fever: chills, musc ache, nau, fever, dry throat, cough, lass; metallic or sweet taste; discoloration skin, hair TO: Eyes, skin, resp sys (incr risk with Wilson's disease)				<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Cotton dust (raw)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> GN2275000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1365 133 (cotton)			
<b>Synonyms/Trade Names:</b> Raw cotton dust					
<b>Exposure Limits:</b> NIOSH REL: TWA <0.200 mg/m <sup>3</sup> See Appendix C OSHA PEL: [Z-1-A & 1910.1043] See Appendix C				<b>Measurement Methods</b> (see Table 1): OSHA [1910.1043]	
<b>Physical Description:</b> Colorless, odorless solid.					
<b>Chemical &amp; Physical Properties:</b> MW: ? BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: Decomposes UEL: NA LEL: NA Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 1 mg/m <sup>3</sup> : Qm 2 mg/m <sup>3</sup> : 95XQ/Sa 5 mg/m <sup>3</sup> : Sa:Cf/PaprHie 10 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 100 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Byssinosis: chest tight, cough, wheez, dysp; decr FEV; bron; mal; fever, chills, upper resp symptoms after initial exposure TO: CVS, resp sys				<b>First Aid (see Table 6):</b> Breath: Fresh air	

<b>Crag® herbicide</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub> OCH <sub>2</sub> CH <sub>2</sub> OSO <sub>3</sub> Na	<b>CAS#:</b> 136-78-7	<b>RTECS#:</b> KK4900000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Crag® herbicide No. 1; 2-(2,4-Dichlorophenoxy)ethyl sodium sulfate; Sesone					
<b>Exposure Limits:</b>		<b>Measurement Methods (see Table 1):</b>			
NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)		NIOSH S356 (II-5)			
OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)					
<b>Physical Description:</b> Colorless to white crystalline, odorless solid. [herbicide]					
<b>Chemical &amp; Physical Properties:</b>		<b>Personal Protection/Sanitation (see Table 2):</b>		<b>Respirator Recommendations (see Tables 3 and 4):</b>	
MW: 309.1 BP: Decomposes Sol(77°F): 26% F.I.P: NA IP: ? Sp.Gr: 1.70 VP: 0.1 mmHg MLT: 473°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid		Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		NIOSH 50 mg/m <sup>3</sup> ; Qm 100 mg/m <sup>3</sup> ; 95XQ/Sa 250 mg/m <sup>3</sup> ; Sa:Cf/PapRHe 500 mg/m <sup>3</sup> ; 100F/PapRTHie*/SaT:Cf*/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b>			<b>First Aid (see Table 6):</b>		
ER: Inh, Ing, Con SY: Irrit eyes, skin; liver, kidney damage; in animals: CNS effects, convuls TO: Eyes, skin, CNS, liver, kidneys			Eye: Irr immed Skin: Water wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>m-Cresol</b>		<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> OH	<b>CAS#:</b> 108-39-4	<b>RTECS#:</b> GO6125000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 4.43 mg/m <sup>3</sup>		<b>DOT:</b> 2076 153			
<b>Synonyms/Trade Names:</b> meta-Cresol, 3-Cresol, m-Cresylic acid, 1-Hydroxy-3-methylbenzene, 3-Hydroxytoluene, 3-Methyl phenol					
<b>Exposure Limits:</b>		<b>Measurement Methods (see Table 1):</b>			
NIOSH REL: TWA 2.3 ppm (10 mg/m <sup>3</sup> )		NIOSH 2546			
OSHA PEL: TWA 5 ppm (22 mg/m <sup>3</sup> ) [skin]		OSHA 32			
<b>Physical Description:</b> Colorless to yellowish liquid with a sweet, tarry odor. [Note: A solid below 54°F.]					
<b>Chemical &amp; Physical Properties:</b>		<b>Personal Protection/Sanitation (see Table 2):</b>		<b>Respirator Recommendations (see Tables 3 and 4):</b>	
MW: 108.2 BP: 397°F Sol: 2% F.I.P: 187°F IP: 8.98 eV Sp.Gr: 1.03 VP(77°F): 0.14 mmHg FRZ: 54°F UEL: ? LEL(300°F): 1.1% Class IIIA Combustible Liquid		Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		NIOSH 23 ppm: CcrOv95/Sa 57.5 ppm: Sa:Cf/PapRovHie 115 ppm: CcrFOv100/GmFOv100/ PapROvHie*/SaT:Cf*/ ScbaF/SaF 250 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b>			<b>First Aid (see Table 6):</b>		
ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; CNS effects: conf, depres, resp fail; dysp, irreg rapid resp, weak pulse; eye, skin burns; derm; lung, liver, kidney, pancreas damage TO: Eyes, skin, resp sys, CNS, liver, kidneys, pancreas, CVS			Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>o-Cresol</b>		<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> OH	<b>CAS#:</b> 95-48-7	<b>RTECS#:</b> GO6300000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 4.43 mg/m <sup>3</sup>		<b>DOT:</b> 2076 153			
<b>Synonyms/Trade Names:</b> ortho-Cresol, 2-Cresol, o-Cresylic acid, 1-Hydroxy-2-methylbenzene, 2-Hydroxytoluene, 2-Methyl phenol					
<b>Exposure Limits:</b> NIOSH REL: TWA 2.3 ppm (10 mg/m <sup>3</sup> ) OSHA PEL: TWA 5 ppm (22 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2546 OSHA 32	
<b>Physical Description:</b> White crystals with a sweet, tarry odor. [Note: A liquid above 88°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 108.2 BP: 376°F Sol: 2% F.I.P.: 178°F IP: 8.93 eV Sp.Gr: 1.05 VP(77°F): 0.29 mmHg MLT: 88°F UEL: ? LEL(300°F): 1.4% Combustible Solid Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>23 ppm:</b> CcrOv95/Sa <b>57.5 ppm:</b> Sa:Cf/Pap/OvHie <b>115 ppm:</b> CcrFOv100/GmFOv100/ PaprTOvHie*/SaT:Cf*/ ScaF/SaF <b>250 ppm:</b> SaF:Pd,Pp §: ScaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv100/ScaBaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; CNS effects: conf, depres, resp fail; dysp, irreg rapid resp, weak pulse; eye, skin burns; dermat; lung, liver, kidney, pancreas damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys, pancreas, CVS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>p-Cresol</b>		<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> OH	<b>CAS#:</b> 106-44-5	<b>RTECS#:</b> GO6475000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 4.43 mg/m <sup>3</sup>		<b>DOT:</b> 2076 153			
<b>Synonyms/Trade Names:</b> para-Cresol, 4-Cresol, p-Cresylic acid, 1-Hydroxy-4-methylbenzene, 4-Hydroxytoluene, 4-Methyl phenol					
<b>Exposure Limits:</b> NIOSH REL: TWA 2.3 ppm (10 mg/m <sup>3</sup> ) OSHA PEL: TWA 5 ppm (22 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2546 OSHA 32	
<b>Physical Description:</b> Crystalline solid with a sweet, tarry odor. [Note: A liquid above 95°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 108.2 BP: 396°F Sol: 2% F.I.P.: 187°F IP: 8.97 eV Sp.Gr: 1.04 VP(77°F): 0.11 mmHg MLT: 95°F UEL: ? LEL(300°F): 1.1% Combustible Solid Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>23 ppm:</b> CcrOv95/Sa <b>57.5 ppm:</b> Sa:Cf/Pap/OvHie <b>115 ppm:</b> CcrFOv100/GmFOv100/ PaprTOvHie*/SaT:Cf*/ ScaF/SaF <b>250 ppm:</b> SaF:Pd,Pp §: ScaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv100/ScaBaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; CNS effects: conf, depres, resp fail; dysp, irreg rapid resp, weak pulse; eye, skin burns; dermat; lung, liver, kidney, pancreas damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys, pancreas, CVS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Crotonaldehyde</b>	<b>Formula:</b> CH <sub>2</sub> CH=CHCHO	<b>CAS#:</b> 4170-30-3	<b>RTECS#:</b> GP9499000	<b>IDLH:</b> 50 ppm
<b>Conversion:</b> 1 ppm = 2.87 mg/m <sup>3</sup>	<b>DOT:</b> 1143 131P (inhibited)			
<b>Synonyms/Trade Names:</b> 2-Butenal, β-Methyl acrolein, Propylene aldehyde				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (6 mg/m <sup>3</sup> ) See Appendix C (Aldehydes) <b>OSHA PEL:</b> TWA 2 ppm (6 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 3516</b> <b>OSHA 81</b>	
<b>Physical Description:</b> Water-white liquid with a suffocating odor. [ <b>Note:</b> Turns pale-yellow on contact with air.]				
<b>Chemical &amp; Physical Properties:</b> MW: 70.1 BP: 219°F Sol: 18% Fl.P: 45°F IP: 9.73 eV Sp.Gr: 0.87 VP: 19 mmHg FRZ: -101°F UEL: 15.5% LEL: 2.1% Class IB Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>20 ppm:</b> CcrOv*/Sa* <b>50 ppm:</b> Sa:Cf*/PaprOv*/CcrFOv/ GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Caustics, ammonia, strong oxidizers, nitric acid, amines [ <b>Note:</b> Polymerization may occur at elevated temperatures, such as in fire conditions.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, resp sys; in animals: dysp, pulm edema, irrit skin TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Crufomate</b>	<b>Formula:</b> C <sub>12</sub> H <sub>19</sub> ClNO <sub>3</sub> P	<b>CAS#:</b> 299-86-5	<b>RTECS#:</b> TB3850000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4-t-Butyl-2-chlorophenylmethyl methylphosphoramidate, Dowco® 132, Ruelene®				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> ST 20 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 0500</b> <b>OSHA PV2015</b>	
<b>Physical Description:</b> White, crystalline solid in pure form. [pesticide] [ <b>Note:</b> Commercial product is a yellow oil.]				
<b>Chemical &amp; Physical Properties:</b> MW: 291.7 BP: Decomposes Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: 1.16 VP(243°F): 0.01 mmHg MLT: 140°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strongly alkaline & strongly acidic media [ <b>Note:</b> Unstable over long periods in aqueous preparations or above 140°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; wheez, dysp; blurred vision, lac; sweat; abdom cramps, diarr, nau, anor TO: Eyes, skin, resp sys, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Cumene</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 98-82-8	<b>RTECS#:</b> GR8575000	<b>IDLH:</b> 900 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.92 mg/m <sup>3</sup>	<b>DOT:</b> 1918 130			
<b>Synonyms/Trade Names:</b> Cumol, Isopropyl benzene, 2-Phenyl propane				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (245 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 50 ppm (245 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 1501	
<b>Physical Description:</b> Colorless liquid with a sharp, penetrating, aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 120.2 BP: 306°F Sol: Insoluble Fl.P: 96°F IP: 8.75 eV Sp.Gr: 0.86 VP: 8 mmHg FRZ: -141°F UEL: 6.5% LEL: 0.9% Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>500 ppm:</b> CcrOv*/Sa* <b>900 ppm:</b> Sa:Cf*/PaprOv*/CcrFOv/ GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, nitric acid, sulfur acid [Note: Forms cumene hydroperoxide upon long exposure to air.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; dermat; head, narco, coma TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Cyanamide</b>	<b>Formula:</b> NH <sub>2</sub> CN	<b>CAS#:</b> 420-04-2	<b>RTECS#:</b> GS9590000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Amidocyanogen, Carbimide, Carbodiimide, Cyanogen nitride, Hydrogen cyanamide [Note: Cyanamide is also a synonym for Calcium cyanamide.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> Crystalline solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 42.1 BP: 500°F (Decomposes) Sol(59°F): 78% Fl.P: 286°F IP: 10.65 eV Sp.Gr: 1.28 VP: ? MLT: 113°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Above 104°F: Moisture, acids, or alkalis; 1,2-phenylene diamine salts [Note: Polymerization may occur on evaporation of aqueous solutions.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; miosis, salv, lac, twitch; Antabuse-like effects TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

Cyanogen		Formula: NCCN	CAS#: 460-19-5	RTECS#: GT1925000	IDLH: N.D.
<b>Conversion:</b> 1 ppm = 2.13 mg/m <sup>3</sup>		<b>DOT:</b> 1026 119			
<b>Synonyms/Trade Names:</b> Carbon nitride, Dicyan, Dicyanogen, Ethanedinitrile, Oxalonnitrile					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (20 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA PV2104	
<b>Physical Description:</b> Colorless gas with a pungent, almond-like odor. [Note: Shipped as a liquefied compressed gas. Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> MW: 52.0 BP: -6°F Sol: 1% F.I.P: NA (Gas) IP: 13.57 eV RGasD: 1.82 Sp.Gr: 0.95 (Liquid at -6°F) VP(70°F): 5.1 atm FRZ: -18°F UEL: 32% LEL: 6.6% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Prevent eye contact/Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Acids, water, strong oxidizers (e.g., dichlorine oxide, fluorine) [Note: Slowly hydrolyzed in water to form hydrogen cyanide, oxalic acid, or ammonia.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Irrit eyes, nose, upper resp sys; lac; cherry red lips, tachypnea, hypernea, bradycardia; head, convuls; dizz, loss of appetite, low-wgt; liquid: frostbite TO: Eyes, resp sys, CNS, CVS				<b>First Aid</b> (see Table 6): <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

Cyanogen chloride		Formula: ClCN	CAS#: 506-77-4	RTECS#: GT2275000	IDLH: N.D.
<b>Conversion:</b> 1 ppm = 2.52 mg/m <sup>3</sup>		<b>DOT:</b> 1589 125 (inhibited)			
<b>Synonyms/Trade Names:</b> Chlorcyan, Chlorine cyanide, Chlorocyanide, Chlorocyanogen					
<b>Exposure Limits:</b> NIOSH REL: C 0.3 ppm (0.6 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas or liquid (below 55°F) with an irritating odor. [Note: Shipped as a liquefied gas. A solid below 20°F. Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> MW: 61.5 BP: 55°F Sol: 7% F.I.P: NA IP: 12.49 eV RGasD: 2.16 Sp.Gr: 1.22 (Liquid at 32°F) VP: 1010 mmHg FRZ: 20°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> When wet or contam (liquid) <b>Remove:</b> When wet or contam (liquid) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (liquid)		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water, acids, alkalis, ammonia, alcohols [Note: Can react very slowly with water to form hydrogen cyanide. May be stabilized to prevent polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs (liquid), Ing (liquid), Con (liquid) SY: Irrit eyes, upper resp sys; cough, delayed pulm edema; lass, head, dizz, conf, nau, vomit; irreg heartbeat; irrit skin (liquid) TO: Eyes, skin, resp sys, CNS, CVS				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed (liquid) <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (liquid)	

<b>Cyclohexane</b>		<b>Formula:</b> C <sub>6</sub> H <sub>12</sub>	<b>CAS#:</b> 110-82-7	<b>RTECS#:</b> GU6300000	<b>IDLH:</b> 1300 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.44 mg/m <sup>3</sup>		<b>DOT:</b> 1145 128			
<b>Synonyms/Trade Names:</b> Benzene hexahydride, Hexahydrobenzene, Hexamethylene, Hexanaphthene					
<b>Exposure Limits:</b> NIOSH REL: TWA 300 ppm (1050 mg/m <sup>3</sup> ) OSHA PEL: TWA 300 ppm (1050 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1500 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a sweet, chloroform-like odor. [Note: A solid below 44°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 84.2 BP: 177°F Sol: Insoluble Fl.P: 0°F IP: 9.88 eV Sp.Gr: 0.78 VP: 78 mmHg FRZ: 44°F UEL: 8% LEL: 1.3% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>1300 ppm:</b> Sa:Cf/Pap/OvE/CcrFOV/ GmFOV/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; drow; dermat; narco, coma TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Cyclohexanethiol</b>		<b>Formula:</b> C <sub>6</sub> H <sub>11</sub> SH	<b>CAS#:</b> 1569-69-3	<b>RTECS#:</b> GV7525000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>		<b>DOT:</b> 3054 129			
<b>Synonyms/Trade Names:</b> Cyclohexylmercaptan, Cyclohexylthiol					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (2.4 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a strong, offensive odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 316°F Sol: Insoluble Fl.P: 110°F IP: ? Sp.Gr: 0.98 VP: 10 mmHg FRZ: -181°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/Pap/Ov <b>25 ppm:</b> CcrFOV/GmFOV/Pap/TOV/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids, alkali metals					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz, lass, nau, vomit, convuls; cough, wheez, laryngitis, dysp TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

Cyclohexanol		Formula: C <sub>6</sub> H <sub>11</sub> OH	CAS#: 108-93-0	RTECS#: GV7875000	IDLH: 400 ppm
<b>Conversion:</b> 1 ppm = 4.10 mg/m <sup>3</sup>		<b>DOT:</b> 1993 128 (combustible liquid, n.o.s.)			
<b>Synonyms/Trade Names:</b> Anol, Cyclohexyl alcohol, Hexahydrophenol, Hexalin, Hydralin, Hydroxycyclohexane					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (200 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 50 ppm (200 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1402, 1405 OSHA 7	
<b>Physical Description:</b> Sticky solid or colorless to light-yellow liquid (above 77°F) with a camphor-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 100.2 BP: 322°F Sol: 4% Fl.P: 154°F IP: 10.00 eV Sp.Gr: 0.96 VP: 1 mmHg MLT: 77°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 400 ppm: CcrOv*/Paprov*/GmFOv/Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as hydrogen peroxide & nitric acid)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; narco TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash prompt Breath: Resp support Swallow: Medical attention immed		

Cyclohexanone		Formula: C <sub>6</sub> H <sub>10</sub> O	CAS#: 108-94-1	RTECS#: GW1050000	IDLH: 700 ppm
<b>Conversion:</b> 1 ppm = 4.02 mg/m <sup>3</sup>		<b>DOT:</b> 1915 127			
<b>Synonyms/Trade Names:</b> Anone, Cyclohexyl ketone, Pimelic ketone					
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (100 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 50 ppm (200 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1300, 2555 OSHA 1	
<b>Physical Description:</b> Water-white to pale-yellow liquid with a peppermint- or acetone-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 98.2 BP: 312°F Sol: 15% Fl.P: 146°F IP: 9.14 eV Sp.Gr: 0.95 VP: 5 mmHg FRZ: -49°F UEL: 9.4% LEL(212°F): 1.1% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 625 ppm: Sa: Cf£/Paprov£ 700 ppm: CcrFOv/GmFOv/PapTOv£/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, nitric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; head; narco, coma; dermat; in animals: liver, kidney damage TO: Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

<b>Cyclohexene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>10</sub>	<b>CAS#:</b> 110-83-8	<b>RTECS#:</b> GW2500000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 3.36 mg/m <sup>3</sup>		<b>DOT:</b> 2256 130			
<b>Synonyms/Trade Names:</b> Benzene tetrahydride, Tetrahydrobenzene					
<b>Exposure Limits:</b> NIOSH REL: TWA 300 ppm (1015 mg/m <sup>3</sup> ) OSHA PEL: TWA 300 ppm (1015 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1500 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a sweet odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 82.2 BP: 181°F Sol: Insoluble Fl.P: 11°F IP: 8.95 eV Sp.Gr: 0.81 VP: 67 mmHg FRZ: -154°F UEL: ? LEL: ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 2000 ppm: Sa:CfE/Pap/OvE/CrFOV/ GmFOV/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Forms explosive peroxides with oxygen upon storage.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; drow TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Cyclohexylamine</b>		<b>Formula:</b> C <sub>6</sub> H <sub>11</sub> NH <sub>2</sub>	<b>CAS#:</b> 108-91-8	<b>RTECS#:</b> GX0700000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.06 mg/m <sup>3</sup>		<b>DOT:</b> 2357 132			
<b>Synonyms/Trade Names:</b> Aminocyclohexane, Aminohexahydrobenzene, Hexahydroaniline, Hexahydrobenzenamine					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (40 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> NIOSH 2010 OSHA PV2016	
<b>Physical Description:</b> Colorless or yellow liquid with a strong, fishy, amine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 99.2 BP: 274°F Sol: Miscible Fl.P: 88°F IP: 8.37 eV Sp.Gr: 0.87 VP: 11 mmHg FRZ: 0°F UEL: 9.4% LEL: 1.5% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, organic compounds, acid anhydrides, acid chlorides, acids, lead [Note: Corrosive to copper, aluminum, zinc & galvanized steel.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb, resp sys; eye, skin burns; skin sens; cough, pulm edema; drow, dizz; diarr, nau, vomit TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Cyclonite</b>		<b>Formula:</b> C <sub>3</sub> H <sub>6</sub> N <sub>6</sub> O <sub>6</sub>	<b>CAS#:</b> 121-82-4	<b>RTECS#:</b> XY9450000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cyclotrimethylenetrinitramine; Hexahydro-1,3,5-trinitro-s-triazine; RDX; Trimethylenetrinitramine; 1,3,5-Trinitro-1,3,5-triazacyclohexane					
<b>Exposure Limits:</b> NIOSH REL: TWA 1.5 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> White, crystalline powder. [Note: A powerful high explosive.]					
<b>Chemical &amp; Physical Properties:</b> MW: 222.2 BP: ? Sol: Insoluble Fl.P: Explodes IP: ? Sp.Gr: 1.82 VP(230°F): 0.0004 mmHg MLT: 401°F UEL: ? LEL: ? Combustible Solid [EXPLOSIVE!]		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, combustible materials, heat [Note: Detonates on contact with mercury fulminate.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; head, irrity, lass, tremor, nau, dizz, vomit, insom, convuls TO: Eyes, skin, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Cyclopentadiene</b>		<b>Formula:</b> C <sub>5</sub> H <sub>6</sub>	<b>CAS#:</b> 542-92-7	<b>RTECS#:</b> GY1000000	<b>IDLH:</b> 750 ppm
<b>Conversion:</b> 1 ppm = 2.70 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,3-Cyclopentadiene					
<b>Exposure Limits:</b> NIOSH REL: TWA 75 ppm (200 mg/m <sup>3</sup> ) OSHA PEL: TWA 75 ppm (200 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2523	
<b>Physical Description:</b> Colorless liquid with an irritating, terpene-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 66.1 BP: 107°F Sol: Insoluble Fl.P(oc): 77°F IP: 8.56 eV Sp.Gr: 0.80 VP: 400 mmHg FRZ: -121°F UEL: ? LEL: ? Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 750 ppm: CcrOv/GmFOv/PapRov/ Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, fuming nitric acid, sulfuric acid [Note: Polymerizes to dicyclopentadiene upon standing.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Cyclopentane</b>	<b>Formula:</b> C <sub>5</sub> H <sub>10</sub>	<b>CAS#:</b> 287-92-3	<b>RTECS#:</b> GY2390000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.87 mg/m <sup>3</sup>		<b>DOT:</b> 1146 128		
<b>Synonyms/Trade Names:</b> Pentamethylene				
<b>Exposure Limits:</b> NIOSH REL: TWA 600 ppm (1720 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a mild, sweet odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 70.2 BP: 121°F Sol: Insoluble Fl.P: -35°F IP: 10.52 eV Sp.Gr: 0.75 VP(88°F): 400 mmHg FRZ: -137°F UEL: 8.7% LEL: 1.1% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., chlorine, bromine, fluorine)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, euph, inco, nau, vomit, stupor; dry, cracking skin TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Cyhexatin</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>11</sub> ) <sub>3</sub> SnOH	<b>CAS#:</b> 13121-70-5	<b>RTECS#:</b> WH8750000	<b>IDLH:</b> 80 mg/m <sup>3</sup> [25 mg/m <sup>3</sup> (as Sn)]
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> TCHH, Tricyclohexylhydroxystannane, Tricyclohexylhydroxytin, Tricyclohexylstannium hydroxide, Tricyclohexyltin hydroxide				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: TWA 0.32 mg/m <sup>3</sup> [0.1 mg/m <sup>3</sup> (as Sn)]			<b>Measurement Methods</b> (see Table 1): NIOSH 5504	
<b>Physical Description:</b> Colorless to white, nearly odorless, crystalline powder. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 385.2 BP: 442°F (Decomposes) Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: 383°F UEL: NA LEL: NA	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>3.2 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>8 mg/m<sup>3</sup>:</b> Sa:Cf/PapRovHie <b>16 mg/m<sup>3</sup>:</b> CcrFOv100/GmFOv100/ PapRTOvHie/SaT:Cf/ScbaF/SaF <b>80 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, ultraviolet light				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz; sore throat, cough; abdom pain, vomit, skin burns, pruritus; in animals: liver, kidney damage TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

D	<b>2,4-D</b>	<b>Formula:</b> Cl <sub>2</sub> C <sub>6</sub> H <sub>3</sub> OCH <sub>2</sub> COOH	<b>CAS#:</b> 94-75-7	<b>RTECS#:</b> AG6825000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
	<b>Conversion:</b>	<b>DOT:</b> 2765 152			
	<b>Synonyms/Trade Names:</b> Dichlorophenoxyacetic acid; 2,4-Dichlorophenoxyacetic acid				
	<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL: TWA 10 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): NIOSH 5001
<b>Physical Description:</b> White to yellow, crystalline, odorless powder. [herbicide]					
<b>Chemical &amp; Physical Properties:</b> MW: 221.0 BP: Decomposes Sol: 0.05% F.L.P: NA IP: ? Sp.Gr: 1.57 VP(320°F): 0.4 mmHg MLT: 280°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>100 mg/m<sup>3</sup>:</b> CcrOv95/GmFOv100/ PaprOvHie/Sa/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Lass, stupor, hyporeflexia, musc twitch; convuls; dermat; in animals: liver, kidney inj <b>TO:</b> Skin, CNS, liver, kidneys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>DDT</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>4</sub> Cl) <sub>2</sub> CHCl <sub>3</sub>	<b>CAS#:</b> 50-29-3	<b>RTECS#:</b> KJ3325000	<b>IDLH:</b> Ca [500 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> p,p'-DDT; Dichlorodiphenyltrichloroethane; 1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.5 mg/m <sup>3</sup> See Appendix A OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH S274 (II-3)
<b>Physical Description:</b> Colorless crystals or off-white powder with a slight, aromatic odor. [pesticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 354.5 BP: 230°F (Decomposes) Sol: Insoluble F.L.P: 162-171°F IP: ? Sp.Gr: 0.99 VP: 0.0000002 mmHg MLT: 227°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>¥:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; pares tongue, lips, face; tremor; anxi, dizz, conf, mal, head, lass; convuls; paresis hands; vomit; [canc] <b>TO:</b> Eyes, skin, CNS, kidneys, liver, PNS [in animals: liver, lung & lymphatic tumors]			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Decaborane</b>	<b>Formula:</b> B <sub>10</sub> H <sub>14</sub>	<b>CAS#:</b> 17702-41-9	<b>RTECS#:</b> HD1400000	<b>IDLH:</b> 15 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 5.00 mg/m <sup>3</sup>		<b>DOT:</b> 1868 134		
<b>Synonyms/Trade Names:</b> Decaboron tetradecahydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.3 mg/m <sup>3</sup> (0.05 ppm) [skin] ST 0.9 mg/m <sup>3</sup> (0.15 ppm) OSHA PEL†: TWA 0.3 mg/m <sup>3</sup> (0.05 ppm) [skin]			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to white crystalline solid with an intense, bitter, chocolate-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 122.2 BP: 415°F Sol: Slight F.I.P: 176°F IP: 9.88 eV Sp.Gr: 0.94 VP: 0.2 mmHg MLT: 211°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 3 mg/m <sup>3</sup> : Sa 7.5 mg/m <sup>3</sup> : Sa:Cf 15 mg/m <sup>3</sup> : SaT:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, water, halogenated compounds (especially carbon tetrachloride) [Note: May ignite SPONTANEOUSLY on exposure to air. Decomposes slowly in hot water.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Dizz, head, nau, drow; inco, local musc spasm, tremor, convuls; lass; in animals: dysp; lass; liver, kidney damage TO: CNS, liver, kidneys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

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<b>1-Decanethiol</b>	<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>9</sub> SH	<b>CAS#:</b> 143-10-2	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.13 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131		
<b>Synonyms/Trade Names:</b> Decylmercaptan, n-Decylmercaptan, 1-Mercaptodecane				
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (3.6 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a strong odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 174.4 BP: 465°F Sol: Insoluble F.I.P: 209°F IP: ? Sp.Gr: 0.84 VP: ? FRZ: -15°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 5 ppm: CcrOv/Sa 12.5 ppm: Sa:Cf/PapRov 25 ppm: CcrFOv/GmFOv/PapRTOv/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong acids & bases, alkali metals, nitric acid				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; conf, dizz, head, drow, nau, vomit, lass, convuls TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>D</b>	<b>Demeton</b>	<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> O) <sub>2</sub> PSOC <sub>2</sub> H <sub>4</sub> SC <sub>2</sub> H <sub>5</sub>	<b>CAS#:</b> 8065-48-3	<b>RTECS#:</b> TF3150000	<b>IDLH:</b> 10 mg/m <sup>3</sup>
	<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> O-O-Diethyl-O(and S)-2-(ethylthio)ethyl phosphorothioate mixture, Systox®					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.1 mg/m <sup>3</sup> [skin]					<b>Measurement Methods</b> (see Table 1): NIOSH 5514
<b>Physical Description:</b> Amber, oily liquid with a sulfur-like odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 258.3 BP: Decomposes Sol: 0.01% F.I.P.: 113°F IP: ? Sp.Gr: 1.12 VP: 0.0003 mmHg FRZ: <-13°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> 1 mg/m <sup>3</sup> : Sa 2.5 mg/m <sup>3</sup> : Sa:Cf 5 mg/m <sup>3</sup> : SaT:Cf/ScbaF/SaF 10 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis, water					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; miosis, ache eyes, rhin, head; chest tight, wheez, lar spasm, salv, cyan; anor, nau, vomit, abdom cramps, diarr; local sweat; musc fasc, lass, para; dizz, conf, ataxia; convuls, coma; low BP; card irreg TO: Eyes, skin, resp sys, CVS, CNS, blood chol				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Diacetone alcohol</b>	<b>Formula:</b> CH <sub>3</sub> COCH <sub>2</sub> C(CH <sub>3</sub> ) <sub>2</sub> OH	<b>CAS#:</b> 123-42-2	<b>RTECS#:</b> SA9100000	<b>IDLH:</b> 1800 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>	<b>DOT:</b> 1148 129			
<b>Synonyms/Trade Names:</b> Diacetone, 4-Hydroxy-4-methyl-2-pentanone, 2-Methyl-2-pentanol-4-one				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (240 mg/m <sup>3</sup> ) OSHA PEL: TWA 50 ppm (240 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1402, 1405 OSHA 7
<b>Physical Description:</b> Colorless liquid with a faint, minty odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 334°F Sol: Miscible F.I.P.: 125°F IP: ? Sp.Gr: 0.94 VP: 1 mmHg FRZ: -47°F UEL: 6.9% LEL: 1.8% Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> 1250 ppm: Sa:Cf£/PapRov£ 1800 ppm: CcrFOv/GmFOv/PapRTOv£/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong alkalis				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; corn damage; in animals: narco, liver damage TO: Eyes, skin, resp sys, CNS, liver				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed

<b>2,4-Diaminoaniso</b> le (and its salts)	<b>Formula:</b> (NH <sub>2</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> OCH <sub>3</sub>	<b>CAS#:</b> 615-05-4	<b>RTECS#:</b> BZ8580500	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,3-Diamino-4-methoxybenzene; 4-Methoxy-1,3-benzene-diamine; 4-Methoxy-m-phenylene-diamine (Synonyms of salts vary depending upon the specific compound.)				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca Minimize occupational exposure (especially skin exposures) See Appendix A <b>OSHA PEL:</b> none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless solid (needles). [Note: The primary use (including its salts such as 2,4-diaminoanisole sulfate) is a component of hair & fur dye formulations.]				
<b>Chemical &amp; Physical Properties:</b> MW: 138.2 BP: ? Sol: ? Fl.P: ? IP: ? Sp.Gr: ? VP: ? MLT: 153°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE	
			<b>Incompatibilities and Reactivities:</b> Strong oxidizers	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> In animals: irrit skin; thyroid, liver changes; terato effects; [carc] <b>TO:</b> Skin, thyroid, liver, repro sys [in animals: thyroid, liver, skin & lymphatic sys tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>o-Dianisidine</b>	<b>Formula:</b> (NH <sub>2</sub> C <sub>6</sub> H <sub>3</sub> OCH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 119-90-4	<b>RTECS#:</b> DD0875000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dianisidine; 3,3'-Dianisidine; 3,3'-Dimethoxybenzidine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A See Appendix C <b>OSHA PEL:</b> See Appendix C			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5013 <b>OSHA</b> 71	
<b>Physical Description:</b> Colorless crystals that turn a violet color on standing. [Note: Used as a basis for many dyes.]				
<b>Chemical &amp; Physical Properties:</b> MW: 244.3 BP: ? Sol: Insoluble Fl.P: 403°F IP: ? Sp.Gr: ? VP: ? MLT: 279°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE	
			<b>Incompatibilities and Reactivities:</b> Oxidizers	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit skin; in animals: kidney, liver damage; thyroid, spleen changes; [carc] <b>TO:</b> Skin, kidneys, liver, thyroid, liver [in animals: bladder, liver, stomach & mammary gland tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Diazinon®</b>	<b>Formula:</b> C <sub>12</sub> H <sub>21</sub> N <sub>2</sub> O <sub>3</sub> PS	<b>CAS#:</b> 333-41-5	<b>RTECS#:</b> TF3325000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> Basudin®; Diazide®; O,O-Diethyl-O-2-isopropyl-4-methyl-6-pyrimidinyl-phosphorothioate; Spectracide®				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 5600</b> <b>OSHA 62</b>	
<b>Physical Description:</b> Colorless liquid with a faint ester-like odor. [insecticide] [ <b>Note:</b> Technical grade is pale to dark brown.]				
<b>Chemical &amp; Physical Properties:</b> MW: 304.4 BP: Decomposes Sol: 0.004% Fl.P: 180°F IP: ? Sp.Gr: 1.12 VP: 0.0001 mmHg FRZ: ? UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> Strong acids & alkalis, copper-containing compounds [ <b>Note:</b> Hydrolyzes slowly in water & dilute acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes; miosis, blurred vision; dizz, conf, lass, convuls; dysp; salv, abdom cramps, nau, vomit <b>TO:</b> Eyes, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Diazomethane</b>	<b>Formula:</b> CH <sub>2</sub> N <sub>2</sub>	<b>CAS#:</b> 334-88-3	<b>RTECS#:</b> PA7000000	<b>IDLH:</b> 2 ppm
<b>Conversion:</b> 1 ppm = 1.72 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Azimethylene, Azomethylene, Diazirine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.2 ppm (0.4 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 0.2 ppm (0.4 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 2515</b>	
<b>Physical Description:</b> Yellow gas with a musty odor. [ <b>Note:</b> Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 42.1 BP: -9°F Sol: Reacts Fl.P: NA (Gas) IP: 9.00 eV RGasD: 1.45 VP: >1 atm FRZ: -229°F UEL: ? LEL: ? Flammable Gas [EXPLOSIVE!]		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2 ppm:</b> Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp,AScba <b>Escape:</b> GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Alkali metals, water, drying agents such as calcium arsenate [ <b>Note:</b> May explode violently on heating, exposure to sunlight, or contact with rough edges such as ground glass.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Irrit eyes; cough, short breath; head, lass; flush skin, fever; chest pain, pulm edema, pneu; asthma; liquid: frostbite <b>TO:</b> Eyes, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Diborane</b>	<b>Formula:</b> B <sub>2</sub> H <sub>6</sub>	<b>CAS#:</b> 19287-45-7	<b>RTECS#:</b> HQ9275000	<b>IDLH:</b> 15 ppm
<b>Conversion:</b> 1 ppm = 1.13 mg/m <sup>3</sup>		<b>DOT:</b> 1911 119		
<b>Synonyms/Trade Names:</b> Boroethane, Boron hydride, Diboron hexahydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.1 mg/m <sup>3</sup> ) OSHA PEL: TWA 0.1 ppm (0.1 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6006	
<b>Physical Description:</b> Colorless gas with a repulsive, sweet odor. [Note: Usually shipped in pressurized cylinders diluted with hydrogen, argon, nitrogen, or helium.]				
<b>Chemical &amp; Physical Properties:</b> MW: 27.7 BP: -135°F Sol: Reacts Fl.P: NA (Gas) IP: 11.38 eV RGasD: 0.97 VP(62°F): 39.5 atm FRZ: -265°F UEL: 88% LEL: 0.8% Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1 ppm: Sa 2.5 ppm: Sa,Cf 5 ppm: SaT:Cf/ScbaF/SaF 15 ppm: Sa,Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water, halogenated compounds, aluminum, lithium, oxidized surfaces, acids [Note: Will ignite spontaneously in moist air at room temperature. Reacts with water to form hydrogen & boric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Chest tight, precordial pain, short breath, nonproductive cough, nau; head, dizz, chills, fever, lass, tremor, musc fasc; in animals: liver, kidney damage; pulm edema; hemorr TO: Resp sys, CNS, liver, kidneys		<b>First Aid (see Table 6):</b> Breath: Resp support		

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<b>1,2-Dibromo-3-chloropropane</b>	<b>Formula:</b> CH <sub>2</sub> BrCHBrCH <sub>2</sub> Cl	<b>CAS#:</b> 96-12-8	<b>RTECS#:</b> TX8750000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 9.67 mg/m <sup>3</sup>		<b>DOT:</b> 2872 159		
<b>Synonyms/Trade Names:</b> 1-Chloro-2,3-dibromopropane; DBCP; Dibromochloropropane				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1044] TWA 0.001 ppm			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Dense yellow or amber liquid with a pungent odor at high concentrations. [pesticide] [Note: A solid below 43°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 236.4 BP: 384°F Sol: 0.1% Fl.P(oc): 170°F IP: ? Sp.Gr: 2.05 VP: 0.8 mmHg FRZ: 43°F UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV100/ScbaE  See Appendix E (page 351)		
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as aluminum, magnesium & tin alloys [Note: Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; drow; nau, vomit; pulm edema; liver, kidney inj; sterility; [carc] TO: Eyes, skin, resp sys, CNS, liver, kidneys, spleen, repro sys, digestive sys [in animals: cancer of the nasal cavity, tongue, pharynx, lungs, stomach, adrenal & mammary glands]		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>2-N-Dibutylaminoethanol</b>	<b>Formula:</b> (C <sub>4</sub> H <sub>9</sub> ) <sub>2</sub> NCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 102-81-8	<b>RTECS#:</b> KK3850000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.09 mg/m <sup>3</sup>	<b>DOT:</b> 2873 153			
<b>Synonyms/Trade Names:</b> Dibutylaminoethanol; 2-Dibutylaminoethanol; 2-Di-N-butylaminoethanol; 2-Di-N-butylaminoethyl alcohol; N,N-Dibutylethanolamine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (14 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 2007</b>	
<b>Physical Description:</b> Colorless liquid with a faint, amine-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 173.3 BP: 446°F Sol: 0.4% F.I.P: 195°F IP: ? Sp.Gr: 0.86 VP: 0.1 mmHg FRZ: ? UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> In animals: irrit eyes, skin, nose; dermat; skin, corn nec; low-wgt <b>TO:</b> Eyes, skin, resp sys		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>2,6-Di-tert-butyl-p-cresol</b>	<b>Formula:</b> [C(CH <sub>3</sub> ) <sub>3</sub> ] <sub>2</sub> CH <sub>3</sub> C <sub>6</sub> H <sub>2</sub> OH	<b>CAS#:</b> 128-37-0	<b>RTECS#:</b> GO7875000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> BHT; Butylated hydroxytoluene; Dibutylated hydroxytoluene; 4-Methyl-2,6-di-tert-butyl phenol				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH P&amp;CAM226 (II-1)</b> <b>OSHA PV2108</b>	
<b>Physical Description:</b> White to pale-yellow, crystalline solid with a slight, phenolic odor. [food preservative]				
<b>Chemical &amp; Physical Properties:</b> MW: 220.4 BP: 509°F Sol: 0.00004% F.I.P: 261°F IP: ? Sp.Gr: 1.05 VP: 0.01 mmHg MLT: 158°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin; in animals: decr growth rate, incr liver weight <b>TO:</b> Eyes, skin		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Dibutyl phosphate</b>	<b>Formula:</b> (C <sub>4</sub> H <sub>9</sub> O) <sub>2</sub> (OH)PO	<b>CAS#:</b> 107-66-4	<b>RTECS#:</b> TB9605000	<b>IDLH:</b> 30 ppm
<b>Conversion:</b> 1 ppm = 8.60 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dibutyl acid o-phosphate, Di-n-butyl hydrogen phosphate, Dibutyl phosphoric acid				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (5 mg/m <sup>3</sup> ) ST 2 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: TWA 1 ppm (5 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 5017	
<b>Physical Description:</b> Pale-amber, odorless liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 210.2 BP: 212°F (Decomposes) Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: 1.06 VP: 1 mmHg (approx) FRZ: ? UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 10 ppm: Sa 25 ppm: Sa:Cf 30 ppm: Sa:T:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; head TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

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<b>Dibutyl phthalate</b>	<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (COOC <sub>4</sub> H <sub>9</sub> ) <sub>2</sub>	<b>CAS#:</b> 84-74-2	<b>RTECS#:</b> TI0875000	<b>IDLH:</b> 4000 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 11.57 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> DBP; Dibutyl-1,2-benzene-dicarboxylate; Di-n-butyl phthalate				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5020 OSHA 104	
<b>Physical Description:</b> Colorless to faint-yellow, oily liquid with a slight, aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 278.3 BP: 644°F Sol(77°F): 0.001% Fl.P: 315°F IP: ? Sp.Gr: 1.05 VP: 0.00007 mmHg FRZ: -31°F UEL: ? LEL(456°F): 0.5% Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 50 mg/m <sup>3</sup> : 95F 125 mg/m <sup>3</sup> : Sa:Cf£/Paprhief£ 250 mg/m <sup>3</sup> : 100F/ScbaF/SaF 4000 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates, strong oxidizers, alkalis & acids; liquid chlorine				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, upper resp sys, stomach TO: Eyes, resp sys, GI tract			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Wash regularly Breath: Resp support Swallow: Medical attention immed	

<b>Dichloroacetylene</b>		<b>Formula:</b> C <sub>2</sub> Cl <sub>2</sub>	<b>CAS#:</b> 7572-29-4	<b>RTECS#:</b> AP1080000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 3.88 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> DCA, Dichloroethyne [Note: DCA is a possible decomposition product of trichloroethylene or trichloroethane.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca C 0.1 ppm (0.4 mg/m <sup>3</sup> ) See Appendix A <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Volatile oil with a disagreeable, sweetish odor. [Note: A gas above 90°F. DCA is not produced commercially.]					
<b>Chemical &amp; Physical Properties:</b> MW: 94.9 BP: 90°F (Explodes) Sol: ? Fl.P: ? IP: ? Sp.Gr: 1.26 VP: ? FRZ: -58 to -87°F UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, heat, shock					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Head, loss of appetite, nau, vomit, intense jaw pain, cranial nerve palsy; in animals: kidney, liver, brain inj; low-wgt; [carc] <b>TO:</b> CNS [in animals: kidney tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Dichlorobenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	<b>CAS#:</b> 95-50-1	<b>RTECS#:</b> CZ4500000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 6.01 mg/m <sup>3</sup>		<b>DOT:</b> 1591 152			
<b>Synonyms/Trade Names:</b> o-DCB; 1,2-Dichlorobenzene; ortho-Dichlorobenzene; o-Dichlorobenzol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 50 ppm (300 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> C 50 ppm (300 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1003</b> <b>OSHA 7</b>	
<b>Physical Description:</b> Colorless to pale-yellow liquid with a pleasant, aromatic odor. [herbicide]					
<b>Chemical &amp; Physical Properties:</b> MW: 147.0 BP: 357°F Sol: 0.01% Fl.P: 151°F IP: 9.06 eV Sp.Gr: 1.30 VP: 1 mmHg FRZ: 1°F UEL: 9.2% LEL: 2.2% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>200 ppm:</b> CcrFOv/PaprvOvE/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, aluminum, chlorides, acids, acid fumes					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose; liver, kidney damage; skin blisters <b>TO:</b> Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>p-Dichlorobenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	<b>CAS#:</b> 106-46-7	<b>RTECS#:</b> CZ4550000	<b>IDLH:</b> Ca [150 ppm]
<b>Conversion:</b> 1 ppm = 6.01 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> p-DCB; 1,4-Dichlorobenzene; para-Dichlorobenzene; Dichlorocide					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: TWA 75 ppm (450 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless or white crystalline solid with a mothball-like odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 147.0 BP: 345°F Sol: 0.008% Fl.P: 150°F IP: 8.98 eV Sp.Gr: 1.25 VP: 1.3 mmHg MLT: 128°F UEL: ? LEL: 2.5% Combustible Solid, but may take some effort to ignite.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as chlorine or permanganate)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Eye irrit, swell periorb; profuse rhinitis; head, anor, nau, vomit; low-wgt, jaun, cirr; in animals: liver, kidney inj; [carc] TO: Liver, resp sys, eyes, kidneys, skin [in animals: liver & kidney cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

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<b>3,3'-Dichlorobenzidine (and its salts)</b>		<b>Formula:</b> NH <sub>2</sub> ClC <sub>6</sub> H <sub>3</sub> C <sub>6</sub> H <sub>3</sub> ClNH <sub>2</sub>	<b>CAS#:</b> 91-94-1	<b>RTECS#:</b> DD0525000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4,4'-Diamino-3,3'-dichlorobiphenyl; Dichlorobenzidine base; o,o'-Dichlorobenzidine; 3,3'-Dichlorobiphenyl-4,4'-diamine; 3,3'-Dichloro-4,4'-biphenyldiamine; 3,3'-Dichloro-4,4'-diaminobiphenyl					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1007] See Appendix B				<b>Measurement Methods</b> (see Table 1): NIOSH 5509 OSHA 65	
<b>Physical Description:</b> Gray to purple, crystalline solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 253.1 BP: 788°F Sol(59°F): 0.07% Fl.P: ? IP: ? Sp.Gr: ? VP: ? MLT: 271°F UEL: ? LEL: ?		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Skin sens, derm; head, dizz; caustic burns; frequent urination, dysuria; hema; GI upset; upper resp infection; [carc] TO: Bladder, liver, lung, skin, GI tract [in animals: liver & bladder cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Dichlorodifluoromethane</b>		<b>Formula:</b> CCl <sub>2</sub> F <sub>2</sub>	<b>CAS#:</b> 75-71-8	<b>RTECS#:</b> PA8200000	<b>IDLH:</b> 15,000 ppm
<b>Conversion:</b> 1 ppm = 4.95 mg/m <sup>3</sup>		<b>DOT:</b> 1028 126			
<b>Synonyms/Trade Names:</b> Difluorodichloromethane, Fluorocarbon 12, Freon® 12, Genetron® 12, Halon® 122, Propellant 12, Refrigerant 12					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1000 ppm (4950 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 1000 ppm (4950 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1018	
<b>Physical Description:</b> Colorless gas with an ether-like odor at extremely high concentrations. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 120.9 BP: -22°F Sol(77°F): 0.03% Fl.P: NA IP: 11.75 eV RGasD: 4.2 VP: 5.7 atm FRZ: -252°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>10,000 ppm:</b> Sa <b>15,000 ppm:</b> Sa:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Dizz, tremor, asphy, uncon, card arrhy, card arrest; liquid: frostbite <b>TO:</b> CVS, PNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>1,3-Dichloro-5,5-dimethylhydantoin</b>		<b>Formula:</b> C <sub>5</sub> H <sub>6</sub> Cl <sub>2</sub> N <sub>2</sub> O <sub>2</sub>	<b>CAS#:</b> 118-52-5	<b>RTECS#:</b> MU0700000	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dactin, DDH, Halane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.2 mg/m <sup>3</sup> ST 0.4 mg/m <sup>3</sup> <b>OSHA PEL†:</b> TWA 0.2 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> White powder with a chlorine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 197.0 BP: ? Sol: 0.2% Fl.P: 346°F IP: ? Sp.Gr: 1.5 VP: ? MLT: 270°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2 mg/m<sup>3</sup>:</b> Sa <b>5 mg/m<sup>3</sup>:</b> Sa:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Water, strong acids, easily oxidized materials such as ammonia salts & sulfides					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, muc memb, resp sys <b>TO:</b> Eyes, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1,1-Dichloroethane</b>		<b>Formula:</b> CHCl <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 75-34-3	<b>RTECS#:</b> KI0175000	<b>IDLH:</b> 3000 ppm
<b>Conversion:</b> 1 ppm = 4.05 mg/m <sup>3</sup>		<b>DOT:</b> 2362 130			
<b>Synonyms/Trade Names:</b> Asymmetrical dichloroethane; Ethylidene chloride; 1,1-Ethylidene dichloride					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (400 mg/m <sup>3</sup> ) See Appendix C (Chloroethanes) OSHA PEL: TWA 100 ppm (400 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless, oily liquid with a chloroform-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 99.0 BP: 135°F Sol: 0.6% F.L.P: 2°F IP: 11.06 eV Sp.Gr: 1.18 VP: 182 mmHg FRZ: -143°F UEL: 11.4% LEL: 5.4% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1000 ppm: Sa 2500 ppm: Sa;Cf 3000 ppm: ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit skin; CNS depres; liver, kidney, lung damage TO: Skin, liver, kidneys, lungs, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush prompt Breath: Resp support Swallow: Medical attention immed	

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<b>1,2-Dichloroethylene</b>		<b>Formula:</b> ClCH=CHCl	<b>CAS#:</b> 540-59-0	<b>RTECS#:</b> KV9360000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 3.97 mg/m <sup>3</sup>		<b>DOT:</b> 1150 130P			
<b>Synonyms/Trade Names:</b> Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene					
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (790 mg/m <sup>3</sup> ) OSHA PEL: TWA 200 ppm (790 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 97.0 BP: 118-140°F Sol: 0.4% F.L.P: 36-39°F IP: 9.65 eV Sp.Gr(77°F): 1.27 VP: 180-265 mmHg FRZ: -57 to -115°F UEL: 12.8% LEL: 5.6% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 2000 ppm: Sa:CfE/PapRovE/CcrFOv/ GmFOv/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong alkalis, potassium hydroxide, copper [Note: Usually contains inhibitors to prevent polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, resp sys; CNS depres TO: Eyes, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

D	<b>Dichloroethyl ether</b>		<b>Formula:</b> (ClCH <sub>2</sub> CH <sub>2</sub> ) <sub>2</sub> O	<b>CAS#:</b> 111-44-4	<b>RTECS#:</b> KN0875000	<b>IDLH:</b> Ca [100 ppm]
	<b>Conversion:</b> 1 ppm = 5.85 mg/m <sup>3</sup>		<b>DOT:</b> 1916 152			
	<b>Synonyms/Trade Names:</b> bis(2-Chloroethyl)ether; 2,2'-Dichlorodiethyl ether, 2,2'-Dichloroethyl ether					
	<b>Exposure Limits:</b> NIOSH REL: Ca TWA 5 ppm (30 mg/m <sup>3</sup> ) ST 10 ppm (60 mg/m <sup>3</sup> ) [skin] See Appendix A <b>OSHA PEL†:</b> TWA 15 ppm (90 mg/m <sup>3</sup> ) [skin]		<b>Measurement Methods (see Table 1):</b> NIOSH 1004 OSHA 7			
<b>Physical Description:</b> Colorless liquid with a chlorinated solvent-like odor.						
<b>Chemical &amp; Physical Properties:</b> MW: 143.0 BP: 352°F Sol: 1% F.I.P: 131°F IP: ? Sp.Gr: 1.22 VP: 0.7 mmHg FRZ: -58°F UEL: ? LEL: 2.7% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> * ScbaF: Pd, Pp/SaF: Pd, Pp, AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Decomposes in presence of moisture to form hydrochloric acid.]						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit nose, throat, resp sys; lac; cough; nau, vomit; in animals: pulm edema; liver damage; [carc] <b>TO:</b> Eyes, resp sys, liver [in animals: liver tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed			

<b>Dichloromonofluoromethane</b>		<b>Formula:</b> CHCl <sub>2</sub> F	<b>CAS#:</b> 75-43-4	<b>RTECS#:</b> PA8400000	<b>IDLH:</b> 5000 ppm
<b>Conversion:</b> 1 ppm = 4.21 mg/m <sup>3</sup>		<b>DOT:</b> 1029 126			
<b>Synonyms/Trade Names:</b> Dichlorofluoromethane, Fluorodichloromethane, Freon® 21, Genetron® 21, Halon® 112, Refrigerant 21					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (40 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 1000 ppm (4200 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 2516	
<b>Physical Description:</b> Colorless gas with a slight, ether-like odor. [Note: A liquid below 48°F. Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 102.9 BP: 48°F Sol(86°F): 0.7% F.I.P: NA IP: 12.39 eV RGasD: 3.57 VP(70°F): 1.6 atm FRZ: -211°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>100 ppm:</b> Sa <b>250 ppm:</b> Sa:Cf <b>500 ppm:</b> ScbaF/SaF <b>5000 ppm:</b> Sa: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp, AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium; acid; acid fumes					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Asphy, card arrhy, card arrest; liquid: frostbite <b>TO:</b> Resp sys, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support		

<b>1,1-Dichloro-1-nitroethane</b>	<b>Formula:</b> CH <sub>3</sub> CCl <sub>2</sub> NO <sub>2</sub>	<b>CAS#:</b> 594-72-9	<b>RTECS#:</b> KI0500000	<b>IDLH:</b> 25 ppm
<b>Conversion:</b> 1 ppm = 5.89 mg/m <sup>3</sup>		<b>DOT:</b> 2650 153		
<b>Synonyms/Trade Names:</b> Dichloronitroethane				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: C 10 ppm (60 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1601 OSHA 7	
<b>Physical Description:</b> Colorless liquid with an unpleasant odor. [fumigant]				
<b>Chemical &amp; Physical Properties:</b> MW: 143.9 BP: 255°F Sol: 0.3% F.I.P: 136°F IP: ? Sp.Gr: 1.43 VP: 15 mmHg FRZ: ? UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>20 ppm:</b> Sa <b>25 ppm:</b> Sa:Cf/ScbaF/SaF <b>§:</b> ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Corrosive to iron in presence of moisture.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, skin; liver, heart, kidney damage; pulm edema, hemorrh TO: Eyes, skin, resp sys, liver, kidneys, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>1,3-Dichloropropene</b>	<b>Formula:</b> ClHC=CHCH <sub>2</sub> Cl	<b>CAS#:</b> 542-75-6	<b>RTECS#:</b> UC8310000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 4.54 mg/m <sup>3</sup>		<b>DOT:</b> 2047 129		
<b>Synonyms/Trade Names:</b> 3-Chloroallyl chloride; DCP; 1,3-Dichloro-1-propene; 1,3-Dichloropropylene; Telone®				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 1 ppm (5 mg/m <sup>3</sup> ) [skin] See Appendix A OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to straw-colored liquid with a sharp, sweet, irritating, chloroform-like odor. [insecticide] [Note: Exists as mixture of cis- & trans-isomers.]				
<b>Chemical &amp; Physical Properties:</b> MW: 111.0 BP: 226°F Sol: 0.2% F.I.P: 77°F IP: ? Sp.Gr: 1.21 VP: 28 mmHg FRZ: -119°F UEL: 14.5% LEL: 5.3% Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>§:</b> ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Aluminum, magnesium, halogens, oxidizers [Note: Epichlorohydrin may be added as a stabilizer.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; lac; head, dizz; in animals; liver, kidney damage; [carc] TO: Eyes, skin, resp sys, CNS, liver, kidneys [in animals: cancer of the bladder, liver, lung & forestomach]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2,2-Dichloropropionic acid</b>		<b>Formula:</b> CH <sub>2</sub> CCl <sub>2</sub> COOH	<b>CAS#:</b> 75-99-0	<b>RTECS#:</b> UF0690000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.85 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dalapon; 2,2-Dichloropropanoic acid; α,α-Dichloropropionic acid					
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (6 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA PV2017	
	<b>Physical Description:</b> Colorless liquid with an acrid odor. [herbicide] [Note: A white to tan powder below 46°F. The sodium salt, a white powder, is often used.]				
<b>Chemical &amp; Physical Properties:</b> MW: 143.0 BP: 374°F Sol: 50% F.I.P: NA IP: ? Sp.Gr: 1.40 VP: ? FRZ: 46°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Metals [Note: Very corrosive to aluminum & copper alloys. Reacts slowly in water to form hydrochloric & pyruvic acids.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; skin burns; lass, loss of appetite, diarr, vomit, slowing of pulse; CNS depres TO: Eyes, skin, resp sys, GI tract, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Dichlorotetrafluoroethane</b>		<b>Formula:</b> CClF <sub>2</sub> CClF <sub>2</sub>	<b>CAS#:</b> 76-14-2	<b>RTECS#:</b> K11101000	<b>IDLH:</b> 15,000 ppm
<b>Conversion:</b> 1 ppm = 6.99 mg/m <sup>3</sup>		<b>DOT:</b> 1958 126			
<b>Synonyms/Trade Names:</b> 1,2-Dichlorotetrafluoroethane; Freon® 114; Genetron® 114; Halon® 242; Refrigerant 114					
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (7000 mg/m <sup>3</sup> ) OSHA PEL: TWA 1000 ppm (7000 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1018	
	<b>Physical Description:</b> Colorless gas with a faint, ether-like odor at high concentrations. [Note: A liquid below 38°F. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 170.9 BP: 38°F Sol: 0.01% F.I.P: NA IP: 12.20 eV RGasD: 5.93 VP(70°F): 1.9 atm FRZ: -137°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10,000 ppm:</b> Sa <b>15,000 ppm:</b> Sa:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium; acids; acid fumes					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Irrit resp sys; asphy; card arrhy, card arrest; liquid: frostbite TO: Resp sys, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support		

<b>Dichlorvos</b>		<b>Formula:</b> (CH <sub>3</sub> O) <sub>2</sub> P(O)OCH=CCl <sub>2</sub>	<b>CAS#:</b> 62-73-7	<b>RTECS#:</b> TC0350000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 9.04 mg/m <sup>3</sup>		<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> DDVP; 2,2-Dichlorovinyl dimethyl phosphate					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH P&CAM295 (II-5) OSHA 62	
<b>Physical Description:</b> Colorless to amber liquid with a mild, chemical odor. [Note: Insecticide that may be absorbed on a dry carrier.]					
<b>Chemical &amp; Physical Properties:</b> MW: 221.0 BP: Decomposes Sol: 0.5% Fl.P: >175°F IP: ? Sp.Gr(77°F): 1.42 VP: 0.01 mmHg FRZ: ? UEL: ? LEL: ? Class III Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 10 mg/m <sup>3</sup> : Sa 25 mg/m <sup>3</sup> : Sa:Cf 50 mg/m <sup>3</sup> : SaT:Cf/ScbaF/SaF 100 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids, strong alkalis [Note: Corrosive to iron & mild steel.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; miosis, ache eyes; rhin; head; chest tight, wheez, lar spasm, salv; cyan; anor, nau, vomit, diarr; sweat; musc fasc, para, dizz, ataxia; convuls; low BP, card irreg TO: Eyes, skin, resp sys, CVS, CNS, blood chol				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

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<b>Dicrotophos</b>		<b>Formula:</b> C <sub>8</sub> H <sub>18</sub> NO <sub>3</sub> P	<b>CAS#:</b> 141-66-2	<b>RTECS#:</b> TC3850000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 9.70 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Bidrin®, Carbicron®, 2-Dimethyl-cis-2-dimethylcarbamoyl-1-methylvinylphosphate					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.25 mg/m <sup>3</sup> [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 5600	
<b>Physical Description:</b> Yellow-brown liquid with a mild, ester odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 237.2 BP: 752°F Sol: Miscible Fl.P: >200°F IP: ? Sp.Gr(59°F): 1.22 VP: 0.0001 mmHg FRZ: ? UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Metals [Note: Corrosive to cast iron, mild steel, brass & stainless steel.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, nau, dizz, anxi, restless, musc twitch, lass, tremor, inco, vomit, abdom cramps, diarr; salv, sweat, lac, rhinitis; anor, mal TO: CNS, blood chol				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Dicyclopentadiene</b>		<b>Formula:</b> C <sub>10</sub> H <sub>12</sub>	<b>CAS#:</b> 77-73-6	<b>RTECS#:</b> PC1050000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.41 mg/m <sup>3</sup>		<b>DOT:</b> 2048 130			
<b>Synonyms/Trade Names:</b> Bicyclopentadiene; DCPD; 1,3-Dicyclopentadiene dimer; 3a,4,7,7a-Tetrahydro-4,7-methanoindene [Note: Exists in two stereoisomeric forms.]					
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (30 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA PV2098	
	<b>Physical Description:</b> Colorless, crystalline solid with a disagreeable, camphor-like odor. [Note: A liquid above 90°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 132.2 BP: 342°F Sol: 0.02% Fl.P(oc): 90°F IP: ? Sp.Gr: 0.98 (Liquid at 95°F) VP: 1.4 mmHg FRZ: 90°F UEL: 6.3% LEL: 0.8% Class IC Flammable Liquid Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
		<b>Incompatibilities and Reactivities:</b> Oxidizers [Note: Depolymerizes at boiling point and forms two molecules of cyclopentadiene. Must be inhibited and maintained under an inert atmosphere to prevent polymerization.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; inco, head; sneez, cough; skin blisters; in animals: kidney, lung damage TO: Eyes, skin, resp sys, CNS, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Dicyclopentadienyl iron</b>		<b>Formula:</b> (C <sub>5</sub> H <sub>5</sub> ) <sub>2</sub> Fe	<b>CAS#:</b> 102-54-5	<b>RTECS#:</b> LK0700000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> bis(Cyclopentadienyl)iron, Ferrocene, Iron dicyclopentadienyl					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods</b> (see Table 1): OSHA ID125G	
<b>Physical Description:</b> Orange, crystalline solid with a camphor-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 186.1 BP: 480°F Sol: Insoluble Fl.P: ? IP: 6.88 eV Sp.Gr: ? VP: ? MLT: 343°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Ammonium perchlorate, tetranitromethane, mercury(II) nitrate					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Possible irrit eyes, skin, resp sys; in animals: liver, RBC, testicular changes TO: Eyes, skin, resp sys, liver, blood, repro sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Dieldrin</b>	<b>Formula:</b> C <sub>12</sub> H <sub>6</sub> Cl <sub>6</sub> O	<b>CAS#:</b> 60-57-1	<b>RTECS#:</b> IO1750000	<b>IDLH:</b> Ca [50 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> HEOD; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,exo-5,8-dimethanonaphthalene				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 0.25 mg/m <sup>3</sup> [skin] See Appendix A <b>OSHA PEL:</b> TWA 0.25 mg/m <sup>3</sup> [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH S283 (II-3)</b>	
<b>Physical Description:</b> Colorless to light-tan crystals with a mild, chemical odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 380.9 <b>BP:</b> Decomposes <b>Sol:</b> 0.02% <b>Fl.P:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 1.75 <b>VP(77°F):</b> 8 x 10 <sup>-7</sup> mmHg <b>MLT:</b> 349°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, active metals such as sodium, strong acids, phenols				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Head, dizz; nau, vomit, mal, sweat; myoclonic limb jerks; clonic, tonic convuls; coma; [carc]; in animals: liver, kidney damage <b>TO:</b> CNS, liver, kidneys, skin [in animals: lung, liver, thyroid & adrenal gland tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Diesel exhaust</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> HZ1755000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific diesel exhaust component.				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 2560, 5040</b>	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific diesel exhaust component.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific component diesel exhaust component.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Eye irrit, pulm func changes; [carc] <b>TO:</b> Eyes, resp sys [in animals: lung tumors]			<b>First Aid (see Table 6):</b> <b>Breath:</b> Resp support	

<b>Diethanolamine</b>		<b>Formula:</b> (HOCH <sub>2</sub> CH <sub>2</sub> ) <sub>2</sub> NH	<b>CAS#:</b> 111-42-2	<b>RTECS#:</b> KL2975000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.30 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> DEA; Di(2-hydroxyethyl)amine; 2,2'-Dihydroxydiethylamine; Diolamine; bis(2-Hydroxyethyl)amine; 2,2'-Iminodiethanol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 3 ppm (15 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none				<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 3509 <b>OSHA</b> PV2018	
<b>Physical Description:</b> Colorless crystals or a syrupy, white liquid (above 82°F) with a mild, ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 105.2 <b>BP:</b> 516°F (Decomposes) <b>Sol:</b> 95% <b>Fl.P.:</b> 279°F <b>IP:</b> ? <b>Sp.Gr.:</b> 1.10 <b>VP:</b> <0.01 mmHg <b>MLT:</b> 82°F <b>UEL:</b> 9.8% <b>LEL:</b> 1.6% Class III B Combustible Liquid Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong acids, acid anhydrides, halides [Note: Reacts with CO <sub>2</sub> in the air. Hygroscopic (i.e., absorbs moisture from the air). Corrosive to copper, zinc, and galvanized iron.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; eye burns, corn nec; skin burns; lac, cough, sneez <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Diethylamine</b>		<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NH	<b>CAS#:</b> 109-89-7	<b>RTECS#:</b> HZ8750000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 2.99 mg/m <sup>3</sup>		<b>DOT:</b> 1154 132			
<b>Synonyms/Trade Names:</b> Diethamine; N,N-Diethylamine; N-Ethylethanamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 ppm (30 mg/m <sup>3</sup> ) ST 25 ppm (75 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 25 ppm (75 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 2010 <b>OSHA</b> 41	
<b>Physical Description:</b> Colorless liquid with a fishy, ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 73.1 <b>BP:</b> 132°F <b>Sol:</b> Miscible <b>Fl.P.:</b> -15°F <b>IP:</b> 8.01 eV <b>Sp.Gr.:</b> 0.71 <b>VP:</b> 192 mmHg <b>FRZ:</b> -58°F <b>UEL:</b> 10.1% <b>LEL:</b> 1.8% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>0.5%) Quick drench (liquid)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>200 ppm:</b> Sa:CfE/PapRSE/CcrFS/GmFS/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, cellulose nitrate					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; in animals; myocardial degeneration <b>TO:</b> Eyes, skin, resp sys, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>2-Diethylaminoethanol</b>		<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 100-37-8	<b>RTECS#:</b> KK5075000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 4.79 mg/m <sup>3</sup>		<b>DOT:</b> 2686 132			
<b>Synonyms/Trade Names:</b> Diethylaminoethanol; 2-Diethylaminoethyl alcohol; N,N-Diethylethanolamine; Diethyl-(2-hydroxyethyl)amine; 2-Hydroxytriethylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 ppm (50 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL:</b> TWA 10 ppm (50 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> <b>(see Table 1):</b> <b>NIOSH 2007</b>	
<b>Physical Description:</b> Colorless liquid with a nauseating, ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 117.2 <b>BP:</b> 325°F <b>Sol:</b> Miscible <b>Fl.P:</b> 126°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.89 <b>VP:</b> 1 mmHg <b>FRZ:</b> -94°F <b>UEL:</b> 11.7% <b>LEL:</b> 6.7% Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>5%) Quick drench		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>100 ppm:</b> CcrOv*/GmFOv/PapRov*/Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; nau, vomit <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Diethylenetriamine</b>		<b>Formula:</b> (NH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> ) <sub>2</sub> NH	<b>CAS#:</b> 111-40-0	<b>RTECS#:</b> IE1225000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.22 mg/m <sup>3</sup>		<b>DOT:</b> 2079 154			
<b>Synonyms/Trade Names:</b> N-(2-Aminoethyl)-1,2-ethanediamine; bis(2-Aminoethyl)amine; DETA; 2,2'-Diaminodiethylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 ppm (4 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none				<b>Measurement Methods</b> <b>(see Table 1):</b> <b>NIOSH 2540</b> <b>OSHA 60</b>	
<b>Physical Description:</b> Colorless to yellow liquid with a strong, ammonia-like odor. [ <b>Note:</b> Hygroscopic (i.e., absorbs moisture from the air).]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 103.2 <b>BP:</b> 405°F <b>Sol:</b> Miscible <b>Fl.P:</b> 208°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.96 <b>VP:</b> 0.4 mmHg <b>FRZ:</b> -38°F <b>UEL:</b> 6.7% <b>LEL:</b> 2% Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> <b>(see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> <b>(see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong acids, cellulose nitrate [ <b>Note:</b> May form explosive complexes with silver, cobalt, or chromium compounds. Corrosive to aluminum, copper, brass & zinc.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb, upper resp sys; derm, skin sens; eye, skin nec; cough, dysp, pulm sens <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>D</b>	<b>Diethyl ketone</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> COCH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 96-22-0	<b>RTECS#:</b> SA8050000	<b>IDLH:</b> N.D.
	<b>Conversion:</b> 1 ppm = 3.53 mg/m <sup>3</sup>		<b>DOT:</b> 1156 127			
<b>Synonyms/Trade Names:</b> DEK, Dimethylacetone, Ethyl ketone, Metacetone, 3-Pentanone, Propione						
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (705 mg/m <sup>3</sup> ) OSHA PEL†: none					<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with an acetone-like odor.						
<b>Chemical &amp; Physical Properties:</b> MW: 86.2 BP: 215°F Sol: 5% Fl.P(oc): 55°F IP: 9.32 eV Sp.Gr: 0.81 VP(77°F): 35 mmHg FRZ: -44°F UEL: 6.4% LEL: 1.6% Class IB Flammable Liquid			<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: Daily Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis, mineral acids, (hydrogen peroxide + nitric acid)						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb, resp sys; cough, sneez TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Diethyl phthalate</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (COOC <sub>2</sub> H <sub>5</sub> ) <sub>2</sub>	<b>CAS#:</b> 84-66-2	<b>RTECS#:</b> T11050000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> DEP, Diethyl ester of phthalic acid, Ethyl phthalate					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none					<b>Measurement Methods</b> (see Table 1): OSHA 104
<b>Physical Description:</b> Colorless to water-white, oily liquid with a very slight, aromatic odor. [pesticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 222.3 BP: 563°F Sol(77°F): 0.1% Fl.P(oc): 322°F IP: ? Sp.Gr: 1.12 VP(77°F): 0.002 mmHg FRZ: -41°F UEL: ? LEL(368°F): 0.7% Class IIIB Combustible Liquid; however, ignition is difficult.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, nitric acid, permanganates, water					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; head, dizz, nau; lac; possible polynneur, vestibular dysfunc; pain, numb, lass, spasms in arms & legs; in animals: repro effects TO: Eyes, skin, resp sys, CNS, PNS, repro sys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Wash regularly Breath: Resp support Swallow: Medical attention immed	

<b>Difluorodibromomethane</b>		<b>Formula:</b> CBr <sub>2</sub> F <sub>2</sub>	<b>CAS#:</b> 75-61-6	<b>RTECS#:</b> PA7525000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 8.58 mg/m <sup>3</sup>		<b>DOT:</b> 1941 171			
<b>Synonyms/Trade Names:</b> Dibromodifluoromethane, Freon® 12B2, Halon® 1202					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (860 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (860 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1012 OSHA 7	
<b>Physical Description:</b> Colorless, heavy liquid or gas (above 76°F) with a characteristic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 209.8 BP: 76°F Sol: Insoluble Fl.P: NA IP: 11.07 eV Sp.Gr(59°F): 2.29 VP: 620 mmHg FRZ: -231°F UEL: NA LEL: NA Noncombustible Liquid Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> N.R. <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> Sa <b>2000 ppm:</b> Sa;Cf/ScbaF/SaF §: ScbaF;Pd,Pp/SaF;Pd,Pp;AScba <b>Escape:</b> GmFOV/ScbaE	
		<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit resp sys; CNS symptoms; liver damage TO: Resp sys, CNS, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Diglycidyl ether</b>		<b>Formula:</b> C <sub>6</sub> H <sub>10</sub> O <sub>3</sub>	<b>CAS#:</b> 2238-07-5	<b>RTECS#:</b> KN2350000	<b>IDLH:</b> Ca [10 ppm]
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Diallyl ether dioxide; DGE; Di(2,3-epoxypropyl) ether; 2-Epoxypropyl ether; bis(2,3-Epoxypropyl) ether					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.1 ppm (0.5 mg/m <sup>3</sup> ) See Appendix A OSHA PEL†: C 0.5 ppm (2.8 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a strong, irritating odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 130.2 BP: 500°F Sol: ? Fl.P: 147°F IP: ? Sp.Gr: 1.12 VP(77°F): 0.09 mmHg FRZ: ? UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ¥: ScbaF;Pd,Pp/SaF;Pd,Pp;AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; skin burns; in animals: hemato sys, lung, liver, kidney damage; repro effects; [carc] TO: Eyes, skin, resp sys, repro sys [in animals: skin tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

D	<b>Diisobutyl ketone</b>		<b>Formula:</b> [(CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> ] <sub>2</sub> CO	<b>CAS#:</b> 108-83-8	<b>RTECS#:</b> MJ5775000	<b>IDLH:</b> 500 ppm	
	<b>Conversion:</b> 1 ppm = 5.82 mg/m <sup>3</sup>		<b>DOT:</b> 1157 128				
	<b>Synonyms/Trade Names:</b> DIBK; sym-Diisopropyl acetone; 2,6-Dimethyl-4-heptanone; Isovalerone; Valerone						
	<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 25 ppm (150 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 50 ppm (290 mg/m <sup>3</sup> )					<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1300, 2555 <b>OSHA</b> 7	
	<b>Physical Description:</b> Colorless liquid with a mild, sweet odor.						
	<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 142.3 <b>BP:</b> 334°F <b>Sol:</b> 0.05% <b>F.I.P.:</b> 120°F <b>IP:</b> 9.04 eV <b>Sp.Gr:</b> 0.81 <b>VP:</b> 2 mmHg <b>FRZ:</b> -43°F <b>UEL(200°F):</b> 7.1% <b>LEL(200°F):</b> 0.8% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>500 ppm:</b> Sa:Cf£/PapOV£/CcrFOv/GmFOv/ScbaF/SaF <b>£:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers							
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; head, dizz; dermat; liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed			

<b>Diisopropylamine</b>		<b>Formula:</b> [(CH <sub>3</sub> ) <sub>2</sub> CH] <sub>2</sub> NH	<b>CAS#:</b> 108-18-9	<b>RTECS#:</b> IM4025000	<b>IDLH:</b> 200 ppm	
<b>Conversion:</b> 1 ppm = 4.14 mg/m <sup>3</sup>		<b>DOT:</b> 1158 132				
<b>Synonyms/Trade Names:</b> DIPA, N-(1-Methylethyl)-2-propanamine						
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 ppm (20 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL:</b> TWA 5 ppm (20 mg/m <sup>3</sup> ) [skin]					<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> S141 (II-4)	
<b>Physical Description:</b> Colorless liquid with an ammonia- or fish-like odor.						
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 101.2 <b>BP:</b> 183°F <b>Sol:</b> Miscible <b>F.I.P.:</b> 20°F <b>IP:</b> 7.73 eV <b>Sp.Gr:</b> 0.72 <b>VP:</b> 70 mmHg <b>FRZ:</b> -141°F <b>UEL:</b> 7.1% <b>LEL:</b> 1.1% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact (>5%) <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>5%)		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>125 ppm:</b> Sa:Cf£/PapOV£ <b>200 ppm:</b> CcrFOv/GmFOv/PapTOv£/ScbaF/SaF <b>£:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; nau, vomit; head; vis dist <b>TO:</b> Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Dimethyl acetamide</b>		<b>Formula:</b> CH <sub>3</sub> CON(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 127-19-5	<b>RTECS#:</b> AB7700000	<b>IDLH:</b> 300 ppm
<b>Conversion:</b> 1 ppm = 3.56 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> N,N-Dimethyl acetamide; DMAC					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (35 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 10 ppm (35 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2004	
<b>Physical Description:</b> Colorless liquid with a weak, ammonia- or fish-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 87.1 BP: 329°F Sol: Miscible Fl.P(oc): 158°F IP: 8.81 eV Sp.Gr: 0.94 VP: 2 mmHg FRZ: -4°F UEL(320°F): 11.5% LEL(212°F): 1.8% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>100 ppm:</b> Sa <b>250 ppm:</b> Sa:Cf <b>300 ppm:</b> ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Carbon tetrachloride, other halogenated compounds when in contact with iron, oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit skin; jaun, liver damage; depres, drow, halu, delusions TO: Skin, liver, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Dimethylamine</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> NH	<b>CAS#:</b> 124-40-3	<b>RTECS#:</b> IP8750000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 1.85 mg/m <sup>3</sup>		<b>DOT:</b> 1032 118 (anhydrous); 1160 132 (solution)			
<b>Synonyms/Trade Names:</b> Dimethylamine (anhydrous), N-Methylmethanamine					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (18 mg/m <sup>3</sup> ) OSHA PEL: TWA 10 ppm (18 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2010 OSHA 34	
<b>Physical Description:</b> Colorless gas with an ammonia- or fish-like odor. [Note: A liquid below 44°F. Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 45.1 BP: 44°F Sol(140°F): 24% Fl.P: NA (Gas) 20°F (Liquid) IP: 8.24 eV RGasD: 1.56 Sp.Gr: 0.67 (Liquid at 44°F) VP: 1.7 atm FRZ: -134°F UEL: 14.4% LEL: 2.8% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) Frostbite <b>Eyes:</b> Prevent eye contact (liquid) Frostbite <b>Wash skin:</b> When contam (liquid) <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (liquid) Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>250 ppm:</b> Sa:Cf£ <b>500 ppm:</b> ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chlorine, mercury, acraldehyde, fluorides, maleic anhydride, aluminum, brass, copper, zinc					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Irrit nose, throat; sneez, cough, dysp; pulm edema; conj; derm; liquid: frostbite TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (liquid)/Frostbite <b>Skin:</b> Water flush immed (liquid)/Frostbite <b>Breath:</b> Resp support		

<b>4-Dimethylaminoazobenzene</b>		<b>Formula:</b> C <sub>8</sub> H <sub>9</sub> NNC <sub>6</sub> H <sub>4</sub> N(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 60-11-7	<b>RTECS#:</b> BX7350000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Butter yellow; DAB; p-Dimethylaminoazobenzene; N,N-Dimethyl-4-aminoazobenzene; Methyl yellow					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL:</b> [1910.1015] See Appendix B				<b>Measurement Methods (see Table 1):</b> NIOSH P&CAM284 (II-4)	
<b>Physical Description:</b> Yellow, leaf-shaped crystals.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 225.3 <b>BP:</b> Sublimes <b>Sol:</b> 0.001% <b>Fl.P.?</b> <b>IP:</b> ? <b>Sp.Gr.?</b> <b>VP:</b> 0.0000003 mmHg (est.) <b>MLT:</b> 237°F <b>UEL:</b> ? <b>LEL:</b> ?		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> 100F/ScbaE  <b>See Appendix E</b> (page 351)	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Enlarged liver; liver, kidney dist; contact dermat; cough, wheez, dysp; bloody sputum; bronchial secretions; frequent urination, hema, dysuria; [carc] <b>TO:</b> Skin, resp sys, liver, kidneys, bladder [in animals: liver & bladder tumors]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>bis(2-(Dimethylamino)ethyl)ether</b>		<b>Formula:</b> C <sub>8</sub> H <sub>20</sub> N <sub>2</sub> O	<b>CAS#:</b> 3033-62-3	<b>RTECS#:</b> KR9460000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> NIAX® A99; NIAX® Catalyst A1; 2,2'-Oxybis(N,N-dimethyl ethylamine) [Note: A component (5%) of NIAX® Catalyst ESN, along with dimethylaminopropionitrile (95%).]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> See Appendix C (NIAX® Catalyst ESN) <b>OSHA PEL:</b> See Appendix C (NIAX® Catalyst ESN)				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Liquid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 160.3 <b>BP:</b> 372°F <b>Sol:</b> ? <b>Fl.P.?</b> <b>IP:</b> ? <b>Sp.Gr.?</b> <b>VP:</b> ? <b>FRZ:</b> ? <b>UEL:</b> ? <b>LEL:</b> ?		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Possible urinary dist, neurological disorders; in animals: irrit eyes, skin <b>TO:</b> Eyes, skin, urinary tract, PNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Dimethylaminopropionitrile</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> NCH <sub>2</sub> CH <sub>2</sub> CN	<b>CAS#:</b> 1738-25-6	<b>RTECS#:</b> UG1575000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 3-(Dimethylamino)propionitrile; N,N-Dimethylamino-3-propionitrile [Note: A component (95%) of NIAX® Catalyst ESN, along with bis(2-(dimethylamino)ethyl) ether (5%).]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> See Appendix C (NIAX® Catalyst ESN) <b>OSHA PEL:</b> See Appendix C (NIAX® Catalyst ESN)			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 98.2 <b>BP:</b> 342°F <b>Sol:</b> Miscible <b>Fl.P:</b> 147°F <b>IP:</b> ? <b>Sp.Gr(86°F):</b> 0.86 <b>VP(135°F):</b> 10 mmHg <b>FRZ:</b> -48°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ⚠: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers [Note: Emits toxic oxides of nitrogen and cyanide fumes when heated to decomposition.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; urinary dist; neurological disorders; pins & needles in hands & feet; musc weak, lass, nau, vomit; decr nerve conduction in lower legs <b>TO:</b> Eyes, skin, CNS, urinary tract			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>N,N-Dimethylaniline</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> N(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 121-69-7	<b>RTECS#:</b> BX4725000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 4.96 mg/m <sup>3</sup>	<b>DOT:</b> 2253 153			
<b>Synonyms/Trade Names:</b> N,N-Dimethylbenzeneamine; N,N-Dimethylphenylamine [Note: Also known as Dimethylaniline which is a correct synonym for Xylidine.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 ppm (25 mg/m <sup>3</sup> ) ST 10 ppm (50 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL:</b> TWA 5 ppm (25 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 2002 <b>OSHA</b> PV2064	
<b>Physical Description:</b> Pale yellow, oily liquid with an amine-like odor. [Note: A solid below 36°F.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 121.2 <b>BP:</b> 378°F <b>Sol:</b> 2% <b>Fl.P:</b> 142°F <b>IP:</b> 7.14 eV <b>Sp.Gr:</b> 0.96 <b>VP:</b> 1 mmHg <b>FRZ:</b> 36°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>50 ppm:</b> Sa <b>100 ppm:</b> Sa:Cf/ScbaF/SaF ⚠: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, benzoyl peroxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Anoxia symptoms: cyan, lass, dizz, ataxia; methemo <b>TO:</b> Blood, kidneys, liver, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	



<b>Dimethylformamide</b>		<b>Formula:</b> HCON(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 68-12-2	<b>RTECS#:</b> LQ2100000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 2.99 mg/m <sup>3</sup>		<b>DOT:</b> 2265 129			
<b>Synonyms/Trade Names:</b> Dimethyl formamide; N,N-Dimethylformamide; DMF					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (30 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 10 ppm (30 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2004 OSHA 66	
<b>Physical Description:</b> Colorless to pale-yellow liquid with a faint, amine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 73.1 BP: 307°F Sol: Miscible F.L.P: 136°F IP: 9.12 eV Sp.Gr: 0.95 VP: 3 mmHg FRZ: -78°F UEL: 15.2% LEL(212°F): 2.2% Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> 100 ppm: Sa* 250 ppm: Sa: Cf* 500 ppm: SaT: Cf*/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Carbon tetrachloride; other halogenated compounds when in contact with iron; strong oxidizers; alkyl aluminums; inorganic nitrates					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; nau, vomit, colic; liver damage, enlarged liver; high BP; face flush; dermat; in animals: kidney, heart damage TO: Eyes, skin, resp sys, liver, kidneys, CVS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>1,1-Dimethylhydrazine</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> NNH <sub>2</sub>	<b>CAS#:</b> 57-14-7	<b>RTECS#:</b> MV2450000	<b>IDLH:</b> Ca [15 ppm]
<b>Conversion:</b> 1 ppm = 2.46 mg/m <sup>3</sup>		<b>DOT:</b> 1163 131			
<b>Synonyms/Trade Names:</b> Dimazine, DMH, UDMH, Unsymmetrical dimethylhydrazine					
<b>Exposure Limits:</b> NIOSH REL: Ca C 0.06 ppm (0.15 mg/m <sup>3</sup> ) [2-hr] See Appendix A OSHA PEL: TWA 0.5 ppm (1 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 3515	
<b>Physical Description:</b> Colorless liquid with an ammonia- or fish-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 147°F Sol: Miscible F.L.P: 5°F IP: 8.05 eV Sp.Gr: 0.79 VP: 103 mmHg FRZ: -72°F UEL: 95% LEL: 2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ¥: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, halogens, metallic mercury, fuming nitric acid, hydrogen peroxide [Note: May ignite SPONTANEOUSLY in contact with oxidizers.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; choking, chest pain, dysp; drow; nau; anoxia; convuls; liver inj; [carc] TO: CNS, liver, GI tract, blood, resp sys, eyes, skin [in animals: tumors of the lungs, liver, blood vessels & intestines]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Dimethylphthalate</b>		<b>Formula:</b> C <sub>8</sub> H <sub>4</sub> (COOCH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 131-11-3	<b>RTECS#:</b> T11575000	<b>IDLH:</b> 2000 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dimethyl ester of 1,2-benzenedicarboxylic acid; DMP					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>					<b>Measurement Methods</b> (see Table 1): OSHA 104
<b>Physical Description:</b> Colorless, oily liquid with a slight, aromatic odor. [Note: A solid below 42°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 194.2 BP: 543°F Sol: 0.4% F.I.P: 295°F IP: 9.64 eV Sp.Gr: 1.19 VP: 0.01 mmHg FRZ: 42°F UEL: ? LEL(358°F): 0.9% Class IIIB Combustible Liquid; however, ignition is difficult.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 50 mg/m <sup>3</sup> ; 95F 125 mg/m <sup>3</sup> ; Sa:Cf/L/Pap/HiefE 250 mg/m <sup>3</sup> ; 100F/ScbaF/SaF 2000 mg/m <sup>3</sup> ; SaF: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, upper resp sys; stomach pain TO: Eyes, resp sys, GI tract			<b>First Aid</b> (see Table 6): Eye: Irr prompt Skin: Wash regularly Breath: Resp support Swallow: Medical attention immed		

<b>Dimethyl sulfate</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> SO <sub>4</sub>	<b>CAS#:</b> 77-78-1	<b>RTECS#:</b> WS8225000	<b>IDLH:</b> Ca [7 ppm]
<b>Conversion:</b> 1 ppm = 5.16 mg/m <sup>3</sup>		<b>DOT:</b> 1595 156			
<b>Synonyms/Trade Names:</b> Dimethyl ester of sulfuric acid, Dimethylsulfate, Methyl sulfate					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.1 ppm (0.5 mg/m <sup>3</sup> ) [skin] See Appendix A OSHA PEL†: TWA 1 ppm (5 mg/m <sup>3</sup> ) [skin]					<b>Measurement Methods</b> (see Table 1): NIOSH 2524
<b>Physical Description:</b> Colorless, oily liquid with a faint, onion-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 126.1 BP: 370°F (Decomposes) Sol(64°F): 3% F.I.P: 182°F IP: ? Sp.Gr: 1.33 VP: 0.1 mmHg FRZ: -25°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ¥: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, ammonia solutions [Note: Decomposes in water to sulfuric acid; corrosive to metals.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose; head; dizz; conj; photo; periorb edema; dysphonia, aphonia, dysphagia, productive cough; chest pain; dyp, cyan; vomit, diarr; dysuria; analgesia; fever; prot, hema; eye, skin burns; delirium; [carc] TO: Eyes, skin, resp sys, liver, kidneys, CNS [in animals: nasal & lung cancer]			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Dinitolmide</b>	<b>Formula:</b> (NO <sub>2</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>2</sub> (CH <sub>3</sub> )CONH <sub>2</sub>	<b>CAS#:</b> 148-01-6	<b>RTECS#:</b> XS4200000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 3,5-Dinitro-o-toluamide; 2-Methyl-3,5-dinitrobenzamide; Zoalene				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> Yellowish, crystalline solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 225.2 BP: ? Sol: Slight Fl.P: NA IP: ? Sp.Gr: ? VP: ? MLT: 351°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Contact eczema; in animals: methemo, liver changes TO: Skin, liver, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

D

<b>m-Dinitrobenzene</b>	<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (NO <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 99-65-0	<b>RTECS#:</b> CZ7350000	<b>IDLH:</b> 50 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1597 152			
<b>Synonyms/Trade Names:</b> meta-Dinitrobenzene; 1,3-Dinitrobenzene				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH S214 (II-4)	
<b>Physical Description:</b> Pale-white or yellow solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 168.1 BP: 572°F Sol: 0.02% Fl.P: 302°F IP: 10.43 eV Sp.Gr: 1.58 VP: ? MLT: 192°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> Qm <b>10 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>25 mg/m<sup>3</sup>:</b> Sa:Cf/PapRHiE <b>50 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PapRTHie/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, caustics, metals such as tin & zinc [Note: Prolonged exposure to fire and heat may result in an explosion due to SPONTANEOUS decomposition.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; vis dist, central scotomas; bad taste, burning mouth, dry throat, thirst; yellowing hair, eyes, skin; anemia; liver damage TO: Eyes, skin, blood, liver, CVS, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>o-Dinitrobenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (NO <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 528-29-0	<b>RTECS#:</b> CZ7450000	<b>IDLH:</b> 50 mg/m <sup>3</sup>	
<b>Conversion:</b>		<b>DOT:</b> 1597 152				
<b>Synonyms/Trade Names:</b> ortho-Dinitrobenzene; 1,2-Dinitrobenzene						
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH S214 (II-4)	
	<b>Physical Description:</b> Pale-white or yellow solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 168.1 BP: 606°F Sol: 0.05% F.I.P.: 302°F IP: 10.71 eV Sp.Gr: 1.57 VP: ? MLT: 244°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> Qm <b>10 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>25 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>50 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, caustics, metals such as tin & zinc [Note: Prolonged exposure to fire and heat may result in an explosion due to SPONTANEOUS decomposition.]						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; vis dist, central scotomas; bad taste, burning mouth, dry throat, thirst; yellowing hair, eyes, skin; anemia; liver damage TO: Eyes, skin, blood, liver, CVS, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>p-Dinitrobenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (NO <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 100-25-4	<b>RTECS#:</b> CZ7525000	<b>IDLH:</b> 50 mg/m <sup>3</sup>	
<b>Conversion:</b>		<b>DOT:</b> 1597 152				
<b>Synonyms/Trade Names:</b> para-Dinitrobenzene; 1,4-Dinitrobenzene						
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH S214 (II-4)	
	<b>Physical Description:</b> Pale-white or yellow solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 168.1 BP: 570°F Sol: 0.01% F.I.P.: ? IP: 10.50 eV Sp.Gr: 1.63 VP: ? MLT: 343°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> Qm <b>10 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>25 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>50 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, caustics, metals such as tin & zinc [Note: Prolonged exposure to fire and heat may result in an explosion due to SPONTANEOUS decomposition.]						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; vis dist, central scotomas; bad taste, burning mouth, dry throat, thirst; yellowing hair, eyes, skin; anemia; liver damage TO: Eyes, skin, blood, liver, CVS, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Dinitro-o-cresol</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>2</sub> OH(NO <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 534-52-1	<b>RTECS#:</b> GO9625000	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1598 153			
<b>Synonyms/Trade Names:</b> 4,6-Dinitro-o-cresol; 3,5-Dinitro-2-hydroxytoluene; 4,6-Dinitro-2-methyl phenol; DNC; DNOC				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.2 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.2 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH S166</b> (II-5)	
<b>Physical Description:</b> Yellow, odorless solid. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 198.1 BP: 594°F Sol: 0.01% F.L.P: NA IP: ? Sp.Gr: 1.1 (estimated) VP: 0.0005 mmHg MLT: 190°F UEL: NA LEL: NA MEC: 30 g/m <sup>3</sup> Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2 mg/m<sup>3</sup>:</b> 95F <b>5 mg/m<sup>3</sup>:</b> 100F/Sa:CfL/Pap/HiefL/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Sense of well being; head, fever, lass, profuse sweat, excess thirst, tacar, hyperpnea, cough, short breath, coma TO: CVS, endocrine sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

D

<b>Dinitrotoluene</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>3</sub> (NO <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 25321-14-6	<b>RTECS#:</b> XT1300000	<b>IDLH:</b> Ca [50 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 1600 152 (molten); 2038 152 (solid)			
<b>Synonyms/Trade Names:</b> Dinitrotoluol, DNT, Methylidinitrobenzene [Note: Various isomers of DNT exist.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 1.5 mg/m <sup>3</sup> [skin] See Appendix A <b>OSHA PEL:</b> TWA 1.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>OSHA 44</b>	
<b>Physical Description:</b> Orange-yellow crystalline solid with a characteristic odor. [Note: Often shipped molten.]				
<b>Chemical &amp; Physical Properties:</b> MW: 182.2 BP: 572°F Sol: Insoluble F.L.P: 404°F IP: ? Sp.Gr: 1.32 VP: 1 mmHg MLT: 158°F UEL: ? LEL: ? Combustible Solid, but difficult to ignite.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, caustics, metals such as tin & zinc [Note: Commercial grades will decompose at 482°F, with self-sustaining decomposition at 536°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; anemia, jaun; repro effects; [carc] TO: Blood, liver, CVS, repro sys [in animals: liver, skin & kidney tumors]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Di-sec octyl phthalate</b>		<b>Formula:</b> C <sub>24</sub> H <sub>38</sub> O <sub>4</sub>	<b>CAS#:</b> 117-81-7	<b>RTECS#:</b> TI0350000	<b>IDLH:</b> Ca [5000 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> DEHP, Di(2-ethylhexyl)phthalate, DOP, bis-(2-Ethylhexyl)phthalate, Octyl phthalate					
<b>D</b>	<b>Exposure Limits:</b>				<b>Measurement Methods (see Table 1):</b> NIOSH 5020
	<b>NIOSH REL:</b> Ca TWA 5 mg/m <sup>3</sup> ST 10 mg/m <sup>3</sup> See Appendix A <b>OSHA PEL†:</b> TWA 5 mg/m <sup>3</sup>				
<b>Physical Description:</b> Colorless, oily liquid with a slight odor.					
<b>Chemical &amp; Physical Properties:</b>		<b>Personal Protection/Sanitation (see Table 2):</b>		<b>Respirator Recommendations (see Tables 3 and 4):</b>	
<b>MW:</b> 390.5 <b>BP:</b> 727°F <b>Sol(75°F):</b> 0.00003% <b>Fl.P(oc):</b> 420°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.99 <b>VP:</b> <0.01 mmHg <b>FRZ:</b> -58°F <b>UEL:</b> ? <b>LEL(474°F):</b> 0.3% Class IIIB Combustible Liquid		<b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>NIOSH</b> †: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, acids & alkalis					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b>				<b>First Aid (see Table 6):</b>	
<b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, muc memb; in animals: liver damage; terato effects; [carc] <b>TO:</b> Eyes, resp sys, CNS, liver, repro sys, GI tract [in animals: liver tumors]				<b>Eye:</b> Irr immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Dioxane</b>		<b>Formula:</b> C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	<b>CAS#:</b> 123-91-1	<b>RTECS#:</b> JG8225000	<b>IDLH:</b> Ca [500 ppm]
<b>Conversion:</b> 1 ppm = 3.60 mg/m <sup>3</sup>		<b>DOT:</b> 1165 127			
<b>Synonyms/Trade Names:</b> Diethylene dioxide; Diethylene ether; Dioxan; p-Dioxane; 1,4-Dioxane					
<b>D</b>	<b>Exposure Limits:</b>				<b>Measurement Methods (see Table 1):</b> NIOSH 1602 OSHA 7
	<b>NIOSH REL:</b> Ca C 1 ppm (3.6 mg/m <sup>3</sup> ) [30-minute] See Appendix A <b>OSHA PEL†:</b> TWA 100 ppm (360 mg/m <sup>3</sup> ) [skin]				
<b>Physical Description:</b> Colorless liquid or solid (below 53°F) with a mild, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b>		<b>Personal Protection/Sanitation (see Table 2):</b>		<b>Respirator Recommendations (see Tables 3 and 4):</b>	
<b>MW:</b> 88.1 <b>BP:</b> 214°F <b>Sol:</b> Miscible <b>Fl.P:</b> 55°F <b>IP:</b> 9.13 eV <b>Sp.Gr:</b> 1.03 <b>VP:</b> 29 mmHg <b>FRZ:</b> 53°F <b>UEL:</b> 22% <b>LEL:</b> 2.0% Class IB Flammable Liquid		<b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>NIOSH</b> †: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, decaborane, triethynyl aluminum					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b>				<b>First Aid (see Table 6):</b>	
<b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; drow, head; nau, vomit; liver damage; kidney failure; [carc] <b>TO:</b> Eyes, skin, resp sys, liver, kidneys [in animals: lung, liver & nasal cavity tumors]				<b>Eye:</b> Irr immed <b>Skin:</b> Water wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Dioxathion</b>	<b>Formula:</b> C <sub>8</sub> H <sub>6</sub> O <sub>2</sub> [SPS(OC <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> ] <sub>2</sub>	<b>CAS#:</b> 78-34-2	<b>RTECS#:</b> TE3350000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Delnav®; p-Dioxane-2,3-diyl ethyl phosphorodithioate; Dioxane phosphate; 2,3-p-Dioxanethiol-S,S-bis(O,O-diethyl phosphoro-dithioate); Navadel®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 mg/m <sup>3</sup> [skin] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Viscous, brown, tan, or dark-amber liquid. [insecticide] [Note: Technical product is a mixture of cis- & trans-isomers.]				
<b>Chemical &amp; Physical Properties:</b> MW: 456.6 BP: ? Sol: Insoluble F.L.P: NA IP: ? Sp.Gr(79°F): 1.26 VP: ? FRZ: -4°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis, iron or tin surfaces, heat				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; head, dizz, lass; rhin, chest tight; miosis; nau, vomit, abdom cramps, diarr, salv; musc fasc; conf, drow TO: Eyes, skin, resp sys, CNS, CVS, blood chol		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Diphenyl</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 92-52-4	<b>RTECS#:</b> DU8050000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 6.31 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Biphenyl, Phenyl benzene				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> (0.2 ppm) OSHA PEL: TWA 1 mg/m <sup>3</sup> (0.2 ppm)			<b>Measurement Methods</b> (see Table 1): NIOSH 2530 OSHA PV2022	
<b>Physical Description:</b> Colorless to pale-yellow solid with a pleasant, characteristic odor. [fungicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 154.2 BP: 489°F Sol: Insoluble F.L.P: 235°F IP: 7.95 eV Sp.Gr: 1.04 VP: 0.005 mmHg MLT: 156°F UEL(311°F): 5.8% LEL(232°F): 0.6% Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash (molt) Quick drench (molt)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>25 mg/m<sup>3</sup>:</b> Sa:Cf/PapRovHie* <b>50 mg/m<sup>3</sup>:</b> CcrFOv100/GmFOv100/ PapRTOvHie*/ScaF/SaF <b>100 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv100/ScaBE	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, throat; head, nau, lass, numb limbs; liver damage TO: Eyes, resp sys, liver, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Diphenylamine</b>		<b>Formula:</b> (C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> NH	<b>CAS#:</b> 122-39-4	<b>RTECS#:</b> JJ7800000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Anilinobenzene, DPA, Phenylaniline, N-Phenylaniline, N-Phenylbenzenamine [Note: The carcinogen 4-Aminodiphenyl may be present as an impurity in the commercial product.]					
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA 22, 78	
	<b>Physical Description:</b> Colorless, tan, amber, or brown crystalline solid with a pleasant, floral odor. [fungicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 169.2 BP: 576°F Sol: 0.03% Fl.P: 307°F IP: 7.40 eV Sp.Gr: 1.16 VP(227°F): 1 mmHg MLT: 127°F UEL: ? LEL: ? Combustible Solid; explosive if a cloud of dust is exposed to a source of ignition.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, hexachloromelamine, trichloromelamine					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; eczema; tacar, hypertension; cough, sneez; methemo; incr BP, heart rate; prot, hema, bladder inj; in animals: terato effects TO: Eyes, skin, resp sys, CVS, blood, bladder, repro sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Dipropylene glycol methyl ether</b>		<b>Formula:</b> CH <sub>2</sub> OC <sub>3</sub> H <sub>6</sub> OC <sub>3</sub> H <sub>6</sub> OH	<b>CAS#:</b> 34590-94-8	<b>RTECS#:</b> JM1575000	<b>IDLH:</b> 600 ppm
<b>Conversion:</b> 1 ppm = 6.06 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dipropylene glycol monomethyl ether, Dowanol® 50B					
<b>D</b>	<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (600 mg/m <sup>3</sup> ) ST 150 ppm (900 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 100 ppm (600 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2554, S69 (II-2)	
	<b>Physical Description:</b> Colorless liquid with a mild, ether-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 148.2 BP: 408°F Sol: Miscible Fl.P: 180°F IP: ? Sp.Gr: 0.95 VP: 0.5 mmHg FRZ: -112°F UEL: 3.0% LEL(392°F): 1.1% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 600 ppm: Sa/ScbaF §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose, throat; lass, dizz, head TO: Eyes, resp sys, CNS			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Dipropyl ketone</b>		<b>Formula:</b> (CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> ) <sub>2</sub> CO	<b>CAS#:</b> 123-19-3	<b>RTECS#:</b> MJ5600000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>		<b>DOT:</b> 2710 128			
<b>Synonyms/Trade Names:</b> Butyrone, DPK, 4-Heptanone, Heptan-4-one, Propyl ketone					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (235 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA 7	
<b>Physical Description:</b> Colorless liquid with a pleasant odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 114.2 BP: 291°F Sol: Insoluble Fl.P: 120°F IP: 9.10 eV Sp.Gr: 0.82 VP: 5 mmHg FRZ: -27°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; CNS depres, dizz, drow, decr breath; in animals: liver inj; narco TO: Eyes, skin, CNS, liver			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

D

<b>Diquat (Diquat dibromide)</b>		<b>Formula:</b> C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> Br <sub>2</sub>	<b>CAS#:</b> 85-00-7	<b>RTECS#:</b> JM5690000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 2781 151 (solid); 2782 131 (liquid)			
<b>Synonyms/Trade Names:</b> Diquat dibromide; 1,1'-Ethylene-2,2'-bipyridylium dibromide [Note: Diquat is a cation (C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> <sup>2+</sup> ; 1,1'-Ethylene-2,2'-bipyridylium ion). Various diquat salts are commercially available.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Dibromide salt: Yellow crystals. [herbicide] [Note: Commercial product may be found in a liquid concentrate or a solution.]					
<b>Chemical &amp; Physical Properties:</b> MW: 344.1 BP: Decomposes Sol: 70% Fl.P: ? IP: ? Sp.Gr: 1.22-1.27 VP: <0.00001 mmHg MLT: 635°F UEL: ? LEL: ? Combustible Solid, but does not readily ignite and burns with difficulty.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis, UV light, basic solutions [Note: Concentrated diquat solutions corrode aluminum.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb, resp sys; rhin, epis; skin burns; nau, vomit, diarr, mal; kidney, liver inj; cough, chest pain, dysp, pulm edema; tremor, convuls; delayed healing of wounds TO: Eyes, skin, resp sys, kidneys, liver, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Disulfiram</b>	<b>Formula:</b> [(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCS] <sub>2</sub> S <sub>2</sub>	<b>CAS#:</b> 97-77-8	<b>RTECS#:</b> JO1225000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Antabuse®, bis(Diethylthiocarbamoyl) disulfide, Ro-Sulfiram®, TETD, Tetraethylthiuram disulfide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 mg/m <sup>3</sup> [Precautions should be taken to avoid concurrent exposure to ethylene dibromide.]			<b>Measurement Methods (see Table 1):</b> None available	
<b>OSHA PEL†:</b> none				
<b>Physical Description:</b> White, yellowish, or light-gray powder with a slight odor. [fungicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 296.6 BP: ? Sol: 0.02% Fl.P: NA IP: ? Sp.Gr: 1.30 VP: ? MLT: 158°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; sens derm; lass, tremor, restless, head, dizz; metallic taste; peri neur; liver damage <b>TO:</b> Eyes, skin, resp sys, CNS, PNS, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Disulfoton</b>	<b>Formula:</b> C <sub>8</sub> H <sub>19</sub> O <sub>2</sub> PS <sub>3</sub>	<b>CAS#:</b> 298-04-4	<b>RTECS#:</b> TD9275000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> O,O-Diethyl S-2-(ethylthio)-ethyl phosphorodithioate; Di-Syston®; Thiodemeton				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 5600</b>	
<b>Physical Description:</b> Oily, colorless to yellow liquid with a characteristic, sulfur odor. [insecticide] [Note: Technical product is a brown liquid.]				
<b>Chemical &amp; Physical Properties:</b> MW: 274.4 BP: ? Sol(73°F): 0.003% Fl.P: >180°F IP: ? Sp.Gr: 1.14 VP: 0.0002 mmHg FRZ: >-13°F UEL: ? LEL: ? Combustible Liquid, but will not ignite easily.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp; eye, skin burns <b>TO:</b> Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Diuron</b>	<b>Formula:</b> C <sub>8</sub> H <sub>3</sub> Cl <sub>2</sub> NHCON(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 330-54-1	<b>RTECS#:</b> YS8925000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 3-(3,4-Dichlorophenyl)-1,1-dimethylurea; Direx®; Karmex®				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5601 OSHA PV2097	
<b>Physical Description:</b> White, odorless, crystalline solid. [herbicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 233.1 BP: 356°F (Decomposes) Sol: 0.004% Fl.P: NA IP: ? Sp.Gr: ? VP: 0.000000002 mmHg MLT: 316°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; in animals: anemia, methemo TO: Eyes, skin, resp sys, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

D

<b>Divinyl benzene</b>	<b>Formula:</b> C <sub>8</sub> H <sub>8</sub> (HC=CH <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 1321-74-0 (mixed isomers)	<b>RTECS#:</b> CZ9370000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>	<b>DOT:</b> 2049 130			
<b>Synonyms/Trade Names:</b> Diethyl benzene, DVB, Vinylstyrene [Note: Commercial product contains all 3 isomers, but m-isomer predominates. Usually contains an inhibitor to prevent polymerization.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (50 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA 89	
<b>Physical Description:</b> Pale, straw-colored liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 130.2 BP: 392°F Sol: 0.005% Fl.P(oc): 169°F IP: ? Sp.Gr: 0.93 VP: 0.7 mmHg FRZ: -88°F UEL: 6.2% LEL: 1.1% Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; skin burns; in animals: CNS depres TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1-Dodecanethiol</b>	<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>11</sub> SH	<b>CAS#:</b> 112-55-0	<b>RTECS#:</b> JR3155000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 8.28 mg/m <sup>3</sup>	<b>DOT:</b> 1228 131			
<b>Synonyms/Trade Names:</b> Dodecyl mercaptan, 1-Dodecyl mercaptan, n-Dodecyl mercaptan, Lauryl mercaptan, n-Lauryl mercaptan, 1-Mercaptododecane				
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (4.1 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless, water-white, or pale-yellow, oily liquid with a mild, skunk-like odor. [Note: A solid below 15°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 202.4 BP: 441-478°F Sol: Insoluble Fl.P(oc): 190°F IP: ? Sp.Gr: 0.85 VP(77°F): 3 mmHg FRZ: 15°F UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/PapRov <b>25 ppm:</b> CcrFov/GmFov/PapRTOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers & acids, strong bases, reducing agents, alkali metals, water, steam				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; cough; dizz, dysp, lass, conf, cyan; abdom pain, nau; skin sens <b>TO:</b> Eyes, skin, resp sys, CNS, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Emery</b>	<b>Formula:</b> Al <sub>2</sub> O <sub>3</sub>	<b>CAS#:</b> 1302-74-5 (corundum)	<b>RTECS#:</b> GN2310000 (corundum)	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Aluminum oxide, Aluminum trioxide, Corundum, Impure corundum, Natural aluminum oxide [Note: Emery is an impure variety of Al <sub>2</sub> O <sub>3</sub> which may contain small impurities of iron, magnesium & silica Corundum is natural Al <sub>2</sub> O <sub>3</sub> .]				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Odorless, white, crystalline powder.				
<b>Chemical &amp; Physical Properties:</b> See α-Alumina for physical & chemical properties.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b>				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed	

<b>Endosulfan</b>	<b>Formula:</b> C <sub>9</sub> H <sub>6</sub> Cl <sub>6</sub> O <sub>2</sub> S	<b>CAS#:</b> 115-29-7	<b>RTECS#:</b> RB9275000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> Benzoepin; Endosulphan; 6,7,8,9,10-Hexachloro-1,5,5a,6,9,9a-hexachloro-6,9-methano-2,4,3-benzo-dioxathiepin-3-oxide; Thiodan®				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>OSHA</b> PV2023	
<b>OSHA PEL†:</b> none				
<b>Physical Description:</b> Brown crystals with a slight, sulfur dioxide odor. [insecticide] [Note: Technical product is a tan, waxy, isomer mixture.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 406.9 <b>BP:</b> Decomposes <b>Sol:</b> 0.00001% <b>Fl.P:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 1.74 <b>VP(77°F):</b> 0.00001 mmHg <b>MLT:</b> 223°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Alkalis, acids, water [Note: Corrosive to iron. Hydrolyzes slowly on contact with water or decomposes in presence of alkalis and acids to form sulfur dioxide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit skin; nau, conf, agitation, flushing, dry mouth, tremor, convuls, head; in animals: kidney, liver inj; decr testis weight <b>TO:</b> Skin, CNS, liver, kidneys, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

E

<b>Endrin</b>	<b>Formula:</b> C <sub>12</sub> H <sub>8</sub> Cl <sub>6</sub> O	<b>CAS#:</b> 72-20-8	<b>RTECS#:</b> IO1575000	<b>IDLH:</b> 2 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> Hexadrin®, 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,endo-5,8-dimethanonaphthalene				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5519	
<b>Physical Description:</b> Colorless to tan, crystalline solid with a mild, chemical odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 380.9 <b>BP:</b> Decomposes <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> ? <b>Sp.Gr:</b> 1.70 <b>VP:</b> Low <b>MLT:</b> 392°F (Decomposes) <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>2 mg/m<sup>3</sup>:</b> Sa:Cf/PapRovHie/ CcrFOV100/GmFOV100/ ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOV100/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, parathion [Note: May emit hydrogen chloride & phosgene when heated or burned.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Epilep convuls; stupor, head, dizz; abdom discomfort, nau, vomit; insom; aggressiveness, conf, drow, lass; anor; in animals: liver damage <b>TO:</b> CNS, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Enflurane</b>	<b>Formula:</b> CHF <sub>2</sub> OCF <sub>2</sub> CHClF	<b>CAS#:</b> 13838-16-9	<b>RTECS#:</b> KN6800000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.55 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-Chloro-1-(difluoromethoxy)-1,1,2-trifluoroethane; 2-Chloro-1,1,2-trifluoroethyl difluoromethyl ether; Ethrane®				
<b>Exposure Limits:</b> NIOSH REL*: C 2 ppm (15.1 mg/m <sup>3</sup> ) [60-minute] [*Note: REL for exposure to waste anesthetic gas.] OSHA PEL: none			<b>Measurement Methods (see Table 1):</b> OSHA 29, 103	
<b>Physical Description:</b> Clear, colorless liquid with a mild, sweet odor. [inhalation anesthetic]				
<b>Chemical &amp; Physical Properties:</b> MW: 184.5 BP: 134°F Sol: Low Fl.P: NA IP: ? Sp.Gr(77°F): 1.52 VP: 175 mmHg FRZ: ? UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; CNS depres, analgesia, anes, convuls, resp depres TO: Eyes, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

<b>Epichlorohydrin</b>	<b>Formula:</b> C <sub>3</sub> H <sub>5</sub> OCl	<b>CAS#:</b> 106-89-8	<b>RTECS#:</b> TX4900000	<b>IDLH:</b> Ca [75 ppm]
<b>Conversion:</b> 1 ppm = 3.78 mg/m <sup>3</sup>	<b>DOT:</b> 2023 131P			
<b>Synonyms/Trade Names:</b> 1-Chloro-2,3-epoxypropane; 2-Chloropropylene oxide; γ-Chloropropylene oxide				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: TWA 5 ppm (19 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> NIOSH 1010 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a slightly irritating, chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 92.5 BP: 242°F Sol: 7% Fl.P: 93°F IP: 10.60 eV Sp.Gr: 1.18 VP: 13 mmHg FRZ: -54°F UEL: 21.0% LEL: 3.8% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ✖: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOvAg/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, certain salts, caustics, zinc, aluminum, water [Note: May polymerize in presence of strong acids and bases, particularly when hot.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin with deep pain; nau, vomit; abdom pain; resp distress, cough; cyan; repro effects; [carc] TO: Eyes, skin, resp sys, kidneys, liver, repro sys [in animals: nasal cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>EPN</b>	<b>Formula:</b> C <sub>14</sub> H <sub>14</sub> O <sub>4</sub> NSP	<b>CAS#:</b> 2104-64-5	<b>RTECS#:</b> TB1925000	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Ethyl p-nitrophenyl benzenethionophosphonate, O-Ethyl O-(4-nitrophenyl) phenylphosphonothioate				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 5012	
<b>Physical Description:</b> Yellow solid with an aromatic odor. [pesticide] [Note: A brown liquid above 97°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 323.3 BP: ? Sol: Insoluble Fl.P: NA IP: ? Sp.Gr(77°F): 1.27 VP(212°F): 0.0003 mmHg MLT: 97°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 5 mg/m <sup>3</sup> : Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOV100/ScbaE
			<b>Incompatibilities and Reactivities:</b> Strong oxidizers	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; miosis, lac; rhin; head; chest tight, wheez, lar spasm; salv; cyan; anor, nau, abdom cramps, diarr; para, convuls; low BP, card irreg TO: Eyes, skin, resp sys, CVS, CNS, blood chol			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

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<b>Ethanolamine</b>	<b>Formula:</b> NH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 141-43-5	<b>RTECS#:</b> KJ5775000	<b>IDLH:</b> 30 ppm
<b>Conversion:</b> 1 ppm = 2.50 mg/m <sup>3</sup>		<b>DOT:</b> 2491 153		
<b>Synonyms/Trade Names:</b> 2-Aminoethanol, β-Aminoethyl alcohol, Ethylolamine, 2-Hydroxyethylamine, Monoethanolamine				
<b>Exposure Limits:</b> NIOSH REL: TWA 3 ppm (8 mg/m <sup>3</sup> ) ST 6 ppm (15 mg/m <sup>3</sup> ) OSHA PEL†: TWA 3 ppm (6 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 2007	
<b>Physical Description:</b> Colorless, viscous liquid or solid (below 51°F) with an unpleasant, ammonia-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 61.1 BP: 339°F Sol: Miscible Fl.P: 186°F IP: 8.96 eV Sp.Gr: 1.02 VP: 0.4 mmHg FRZ: 51°F UEL: 23.5% LEL(284°F): 3.0% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 30 ppm: CcrS*/GmFS/PaprS*/Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, iron [Note: May attack copper, brass, and rubber.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; drow TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed	

<b>Ethion</b>	<b>Formula:</b> [(C <sub>2</sub> H <sub>5</sub> O) <sub>2</sub> P(S)S] <sub>2</sub> CH <sub>2</sub>	<b>CAS#:</b> 563-12-2	<b>RTECS#:</b> TE4550000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> O,O,O',O'-Tetraethyl S,S'-methylene di(phosphorodithioate)				
<b>Exposure Limits:</b> NIOSH REL: 0.4 mg/m <sup>3</sup> [skin] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5600	
<b>Physical Description:</b> Colorless to amber-colored, odorless liquid. [insecticide] [Note: A solid below 10°F. The technical product has a very disagreeable odor.]				
<b>Chemical &amp; Physical Properties:</b> MW: 384.5 BP: >302°F (Decomposes) Sol: 0.0001% F.I.P: 349°F IP: ? Sp.Gr: 1.22 VP: 0.0000015 mmHg FRZ: 10°F UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Acids, alkalis				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp TO: Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2-Ethoxyethanol</b>	<b>Formula:</b> C <sub>2</sub> H <sub>5</sub> OCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 110-80-5	<b>RTECS#:</b> KK8050000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 3.69 mg/m <sup>3</sup>	<b>DOT:</b> 1171 127			
<b>Synonyms/Trade Names:</b> Cellosolve®, EGEE, Ethylene glycol monoethyl ether				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 ppm (1.8 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 200 ppm (740 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 1403 OSHA 53, 79	
<b>Physical Description:</b> Colorless liquid with a sweet, pleasant, ether-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 90.1 BP: 275°F Sol: Miscible F.I.P: 110°F IP: ? Sp.Gr: 0.93 VP: 4 mmHg FRZ: -130°F UEL(200°F): 15.6% LEL(200°F): 1.7% Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH <b>5 ppm:</b> Sa* <b>12.5 ppm:</b> Sa: Cf* <b>25 ppm:</b> ScbaF/SaF <b>500 ppm:</b> Sa: Pd, Pp* §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFov/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: In animals: irrit eyes, resp sys; blood changes; liver, kidney, lung damage; repro, terato effects TO: Eyes, resp sys, blood, kidneys, liver, repro sys, hemato sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2-Ethoxyethyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOCH <sub>2</sub> CH <sub>2</sub> OC <sub>2</sub> H <sub>5</sub>	<b>CAS#:</b> 111-15-9	<b>RTECS#:</b> KK8225000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 5.41 mg/m <sup>3</sup>		<b>DOT:</b> 1172 129			
<b>Synonyms/Trade Names:</b> Cellosolve® acetate, EGEEA, Ethylene glycol monoethyl ether acetate, Glycol monoethyl ether acetate					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 ppm (2.7 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 100 ppm (540 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 1450 OSHA 53	
<b>Physical Description:</b> Colorless liquid with a mild odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 132.2 BP: 313°F Sol: 23% Fl.P: 124°F IP: ? Sp.Gr: 0.98 VP: 2 mmHg FRZ: -79°F UEL: ? LEL: 1.7% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>5 ppm:</b> CcrOv*/Sa* <b>12.5 ppm:</b> Sa:Cf*/PaprOv* <b>25 ppm:</b> CcrFOv/GmFOv/PaprTOv*/ScbaF/SaF <b>500 ppm:</b> Sa:Pd,Pp* <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose; vomit; kidney damage; para; in animals: repro, terato effects <b>TO:</b> Eyes, resp sys, GI tract, repro sys, hemato sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Ethyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	<b>CAS#:</b> 141-78-6	<b>RTECS#:</b> AH5425000	<b>IDLH:</b> 2000 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.60 mg/m <sup>3</sup>		<b>DOT:</b> 1173 129			
<b>Synonyms/Trade Names:</b> Acetic ester, Acetic ether, Ethyl ester of acetic acid, Ethyl ethanoate					
<b>Exposure Limits:</b> NIOSH REL: TWA 400 ppm (1400 mg/m <sup>3</sup> ) OSHA PEL: TWA 400 ppm (1400 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1457 OSHA 7	
<b>Physical Description:</b> Colorless liquid with an ether-like, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 88.1 BP: 171°F Sol(77°F): 10% Fl.P: 24°F IP: 10.01 eV Sp.Gr: 0.90 VP: 73 mmHg FRZ: -117°F UEL: 11.5% LEL: 2.0% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa:Cf£/PaprOv£/CcrFOv/GmFOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; narco; derm <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Ethyl acrylate</b>		<b>Formula:</b> CH <sub>2</sub> =CHCOOC <sub>2</sub> H <sub>5</sub>	<b>CAS#:</b> 140-88-5	<b>RTECS#:</b> AT0700000	<b>IDLH:</b> Ca [300 ppm]
<b>Conversion:</b> 1 ppm = 4.09 mg/m <sup>3</sup>		<b>DOT:</b> 1917 129P (inhibited)			
<b>Synonyms/Trade Names:</b> Ethyl acrylate (inhibited), Ethyl ester of acrylic acid, Ethyl propenoate					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL†:</b> TWA 25 ppm (100 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1450 <b>OSHA</b> 92	
<b>Physical Description:</b> Colorless liquid with an acrid odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 100.1 <b>BP:</b> 211°F <b>Sol:</b> 2% <b>Fl.P:</b> 48°F <b>IP:</b> 10.30 eV <b>Sp.Gr:</b> 0.92 <b>VP:</b> 29 mmHg <b>FRZ:</b> -96°F <b>UEL:</b> 14% <b>LEL:</b> 1.4% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, peroxides, polymerizers, strong alkalis, moisture, chlorosulfonic acid [ <b>Note:</b> Polymerizes readily unless an inhibitor such as hydroquinone is added.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; [carc] <b>TO:</b> Eyes, skin, resp sys [in animals: tumors of the forestomach]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Ethyl alcohol</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 64-17-5	<b>RTECS#:</b> KQ6300000	<b>IDLH:</b> 3300 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 1.89 mg/m <sup>3</sup>		<b>DOT:</b> 1170 127			
<b>Synonyms/Trade Names:</b> Alcohol, Cologne spirit, Ethanol, EtOH, Grain alcohol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1000 ppm (1900 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 1000 ppm (1900 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1400 <b>OSHA</b> 100	
<b>Physical Description:</b> Clear, colorless liquid with a weak, ethereal, vinous odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 46.1 <b>BP:</b> 173°F <b>Sol:</b> Miscible <b>Fl.P:</b> 55°F <b>IP:</b> 10.47 eV <b>Sp.Gr:</b> 0.79 <b>VP:</b> 44 mmHg <b>FRZ:</b> -173°F <b>UEL:</b> 19% <b>LEL:</b> 3.3% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>3300 ppm:</b> Sa/ScbaF §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba <b>Escape:</b> ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, potassium dioxide, bromine pentafluoride, acetyl bromide, acetyl chloride, platinum, sodium					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose; head, drow, lass, narco; cough; liver damage; anemia; repro, terato effects <b>TO:</b> Eyes, skin, resp sys, CNS, liver, blood, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Ethylamine</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> NH <sub>2</sub>	<b>CAS#:</b> 75-04-7	<b>RTECS#:</b> KH2100000	<b>IDLH:</b> 600 ppm
<b>Conversion:</b> 1 ppm = 1.85 mg/m <sup>3</sup>		<b>DOT:</b> 1036 118			
<b>Synonyms/Trade Names:</b> Aminoethane, Ethylamine (anhydrous), Monoethylamine					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (18 mg/m <sup>3</sup> ) OSHA PEL: TWA 10 ppm (18 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH S144 (II-3) OSHA 36	
<b>Physical Description:</b> Colorless gas or water-white liquid (below 62°F) with an ammonia-like odor. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 45.1 BP: 62°F Sol: Miscible Fl.P: 1°F IP: 8.86 eV RGasD: 1.61 Sp.Gr: 0.69 (Liquid) VP: 874 mmHg FRZ: -114°F UEL: 14.0% LEL: 3.5% Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> When contam (liquid) <b>Remove:</b> When wet or contam (liquid) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (liquid)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>250 ppm:</b> Sa:Cf£/PapRSE <b>500 ppm:</b> CcrFS/GmFS/ScbaF/SaF <b>600 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong acids; strong oxidizers; copper, tin & zinc in presence of moisture; cellulose nitrate; chlorine; hypochlorites					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs (liquid), Ing (liquid), Con (liquid) SY: Irrit eyes, skin, resp sys; skin burns, derm TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (liquid) <b>Skin:</b> Water flush immed (liquid) <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (liquid)		

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<b>Ethyl benzene</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> C <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 100-41-4	<b>RTECS#:</b> DA0700000	<b>IDLH:</b> 800 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.34 mg/m <sup>3</sup>		<b>DOT:</b> 1175 130			
<b>Synonyms/Trade Names:</b> Ethylbenzol, Phenylethane					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (435 mg/m <sup>3</sup> ) ST 125 ppm (545 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (435 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1501 OSHA 7, 1002	
<b>Physical Description:</b> Colorless liquid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 106.2 BP: 277°F Sol: 0.01% Fl.P: 55°F IP: 8.76 eV Sp.Gr: 0.87 VP: 7 mmHg FRZ: -139°F UEL: 6.7% LEL: 0.8% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>800 ppm:</b> CcrOv*/GmFOv/PapRov*/ Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; head; derm; narco, coma TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Ethyl bromide</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> Br	<b>CAS#:</b> 74-96-4	<b>RTECS#:</b> KH6475000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 4.46 mg/m <sup>3</sup>		<b>DOT:</b> 1891 131			
<b>Synonyms/Trade Names:</b> Bromoethane, Monobromoethane					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 200 ppm (890 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1011 OSHA 7	
<b>Physical Description:</b> Colorless to yellow liquid with an ether-like odor. [Note: A gas above 101°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 109.0 BP: 101°F Sol: 0.9% Fl.P: <4°F IP: 10.29 eV Sp.Gr: 1.46 VP: 375 mmHg FRZ: -182°F UEL: 8.0% LEL: 6.8% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): OSHA 2000 ppm: Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; CNS depres; pulm edema; liver, kidney disease; card arrhy, card arrest TO: Eyes, skin, resp sys, liver, kidneys, CVS, CNS			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap flush prompt Breath: Resp support Swallow: Medical attention immed		

<b>Ethyl butyl ketone</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CO[CH <sub>2</sub> ] <sub>3</sub> CH <sub>3</sub>	<b>CAS#:</b> 106-35-4	<b>RTECS#:</b> MJ5250000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>		<b>DOT:</b> 1224 127			
<b>Synonyms/Trade Names:</b> Butyl ethyl ketone, 3-Heptanone					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (230 mg/m <sup>3</sup> ) OSHA PEL: TWA 50 ppm (230 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1301, 2553 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a powerful, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 114.2 BP: 298°F Sol: 1% Fl.P(oc): 115°F IP: 9.02 eV Sp.Gr: 0.82 VP: 4 mmHg FRZ: -38°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 500 ppm: CcrOv*/Sa* 1000 ppm: Sa:Cf*/PaprOv*/CcrFOv/ GmFov/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, acetaldehyde, perchloric acid					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; head, narco, coma; derm TO: Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush Breath: Resp support Swallow: Medical attention immed		

<b>Ethyl chloride</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> Cl	<b>CAS#:</b> 75-00-3	<b>RTECS#:</b> KH7525000	<b>IDLH:</b> 3800 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 2.64 mg/m <sup>3</sup>		<b>DOT:</b> 1037 115			
<b>Synonyms/Trade Names:</b> Chloroethane, Hydrochloric ether, Monochloroethane, Muriatic ether					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Handle with caution in the workplace. See Appendix C (Chloroethanes) <b>OSHA PEL:</b> TWA 1000 ppm (2600 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): <b>NIOSH 2519</b>	
<b>Physical Description:</b> Colorless gas or liquid (below 54°F) with a pungent, ether-like odor. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 64.5 <b>BP:</b> 54°F <b>Sol:</b> 0.6% <b>Fl.P:</b> NA (Gas) -58°F (Liquid) <b>IP:</b> 10.97 eV <b>RGasD:</b> 2.23 <b>Sp.Gr:</b> 0.92 (Liquid at 32°F) <b>VP:</b> 1000 mmHg <b>FRZ:</b> -218°F <b>UEL:</b> 15.4% <b>LEL:</b> 3.8% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>3800 ppm:</b> Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium; oxidizers; water or steam [Note: Reacts with water to form hydrochloric acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs (liquid), Ing (liquid), Con <b>SY:</b> Inco, inebri; abdom cramps; card arrhy, card arrest; liver, kidney damage <b>TO:</b> Liver, kidneys, resp sys, CVS, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (liquid) <b>Skin:</b> Water flush prompt (liquid) <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (liquid)		

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<b>Ethylene chlorohydrin</b>		<b>Formula:</b> CH <sub>2</sub> ClCH <sub>2</sub> OH	<b>CAS#:</b> 107-07-3	<b>RTECS#:</b> KK0875000	<b>IDLH:</b> 7 ppm
<b>Conversion:</b> 1 ppm = 3.29 mg/m <sup>3</sup>		<b>DOT:</b> 1135 131			
<b>Synonyms/Trade Names:</b> 2-Chloroethanol, 2-Chloroethyl alcohol, Ethylene chlorhydrin					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 1 ppm (3 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> TWA 5 ppm (16 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): <b>NIOSH 2513</b> <b>OSHA 7</b>	
<b>Physical Description:</b> Colorless liquid with a faint, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 80.5 <b>BP:</b> 262°F <b>Sol:</b> Miscible <b>Fl.P:</b> 140°F <b>IP:</b> 10.90 eV <b>Sp.Gr:</b> 1.20 <b>VP:</b> 5 mmHg <b>FRZ:</b> -90°F <b>UEL:</b> 15.9% <b>LEL:</b> 4.9% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>7 ppm:</b> Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics, water or steam					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit muc memb; nau, vomit; dizz, inco; numb; vis dist; head; thirst; delirium; low BP; collapse, shock, coma; liver, kidney damage <b>TO:</b> Resp sys, liver, kidneys, CNS, CVS, eyes			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Ethylenediamine</b>		<b>Formula:</b> NH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> NH <sub>2</sub>	<b>CAS#:</b> 107-15-3	<b>RTECS#:</b> KH8575000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 2.46 mg/m <sup>3</sup>		<b>DOT:</b> 1604 132			
<b>Synonyms/Trade Names:</b> 1,2-Diaminoethane; 1,2-Ethanediamine; Ethylenediamine (anhydrous)					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (25 mg/m <sup>3</sup> ) OSHA PEL: TWA 10 ppm (25 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2540 OSHA 60	
<b>Physical Description:</b> Colorless, viscous liquid with an ammonia-like odor. [fungicide] [Note: A solid below 47°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 241°F Sol: Miscible Fl.P: 93°F IP: 8.60 eV Sp.Gr: 0.91 VP: 11 mmHg FRZ: 47°F UEL(212°F): 12% LEL(212°F): 2.5% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet (flamm) Change: N.R. Provide: Eyewash (>5%) Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 250 ppm: Sa:Cf£/PaprS£ 500 ppm: CcrFS/GmFS/PaprT£/ ScbaF/SaF 1000 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE	
		<b>Incompatibilities and Reactivities:</b> Strong acids & oxidizers, carbon tetrachloride & other chlorinated organic compounds, carbon disulfide [Note: Corrosive to metals.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit nose, resp sys; sens derm; asthma; liver, kidney damage TO: Skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Ethylene dibromide</b>		<b>Formula:</b> BrCH <sub>2</sub> CH <sub>2</sub> Br	<b>CAS#:</b> 106-93-4	<b>RTECS#:</b> KH9275000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 7.69 mg/m <sup>3</sup>		<b>DOT:</b> 1605 154			
<b>Synonyms/Trade Names:</b> 1,2-Dibromoethane; Ethylene bromide; Glycol dibromide					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.045 ppm C 0.13 ppm [15-minute] See Appendix A OSHA PEL: TWA 20 ppm C 30 ppm 50 ppm [5-minute maximum peak]				<b>Measurement Methods</b> (see Table 1): NIOSH 1008 OSHA 2	
<b>Physical Description:</b> Colorless liquid or solid (below 50°F) with a sweet odor. [fumigant]					
<b>Chemical &amp; Physical Properties:</b> MW: 187.9 BP: 268°F Sol: 0.4% Fl.P: NA IP: 9.45 eV Sp.Gr: 2.17 VP: 12 mmHg FRZ: 50°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
		<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, hot aluminum & magnesium; liquid ammonia; strong oxidizers			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; derm with vesic; liver, heart, spleen, kidney damage; repro effects; [carc] TO: Eyes, skin, resp sys, liver, kidneys, repro sys [in animals: skin & lung tumors]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Ethylene dichloride</b>	<b>Formula:</b> ClCH <sub>2</sub> CH <sub>2</sub> Cl	<b>CAS#:</b> 107-06-2	<b>RTECS#:</b> K10525000	<b>IDLH:</b> Ca [50 ppm]
<b>Conversion:</b> 1 ppm = 4.05 mg/m <sup>3</sup>	<b>DOT:</b> 1184 131			
<b>Synonyms/Trade Names:</b> 1,2-Dichloroethane; Ethylene chloride; Glycol dichloride				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 1 ppm (4 mg/m <sup>3</sup> ) ST 2 ppm (8 mg/m <sup>3</sup> ) See Appendix A, See Appendix C (Chloroethanes) OSHA PEL†: TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]			<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 3	
<b>Physical Description:</b> Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.]				
<b>Chemical &amp; Physical Properties:</b> MW: 99.0 BP: 182°F Sol: 0.9% Fl.P: 56°F IP: 11.05 eV Sp.Gr: 1.24 VP: 64 mmHg FRZ: -32°F UEL: 16% LEL: 6.2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers & caustics; chemically-active metals such as magnesium or aluminum powder, sodium & potassium; liquid ammonia [Note: Decomposes to vinyl chloride & HCl above 1112°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Abs, Con SY: Irrit eyes, corn opac; CNS depres; nau, vomit; dermat; liver, kidney, CVS damage; [carc] TO: Eyes, skin, kidneys, liver, CNS, CVS [in animals: forestomach, mammary gland & circulatory sys cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

E

<b>Ethylene glycol</b>	<b>Formula:</b> HOCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 107-21-1	<b>RTECS#:</b> KW2975000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2-Dihydroxyethane; 1,2-Ethandiol; Glycol; Glycol alcohol; Monoethylene glycol				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5523 OSHA PV2024	
<b>Physical Description:</b> Clear, colorless, syrupy, odorless liquid. [antifreeze] [Note: A solid below 9°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 62.1 BP: 388°F Sol: Miscible Fl.P: 232°F IP: ? Sp.Gr: 1.11 VP: 0.06 mmHg FRZ: 9°F UEL: 15.3% LEL: 3.2% Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chromium trioxide, potassium permanganate, sodium peroxide [Note: Hygroscopic (i.e., absorbs moisture from the air).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; nau, vomit, abdom pain, lass; dizz, stupor, convuls, CNS depres; skin sens TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Ethylene glycol dinitrate</b>		<b>Formula:</b> O <sub>2</sub> NOCH <sub>2</sub> CH <sub>2</sub> ONO <sub>2</sub>	<b>CAS#:</b> 628-96-6	<b>RTECS#:</b> KW5600000	<b>IDLH:</b> 75 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 6.22 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> EGDN; 1,2-Ethanediol dinitrate; Ethylene dinitrate; Ethylene nitrate; Glycol dinitrate; Nitroglycol					
<b>Exposure Limits:</b> NIOSH REL: ST 0.1 mg/m <sup>3</sup> [skin] OSHA PEL†: C 0.2 ppm (1 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 2507 OSHA 43	
<b>Physical Description:</b> Colorless to yellow, oily, odorless liquid. [Note: An explosive ingredient (60-80%) in dynamite along with nitroglycerine (40-20%).]					
<b>Chemical &amp; Physical Properties:</b> MW: 152.1 BP: 387°F Sol: Insoluble F.L.P.: 419°F IP: ? Sp.Gr: 1.49 VP: 0.05 mmHg FRZ: -8°F UEL: ? LEL: ? Explosive Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: Daily Provide: Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 1 mg/m <sup>3</sup> : Sa* 2.5 mg/m <sup>3</sup> : Sa: Cf* 5 mg/m <sup>3</sup> : Sa:T: Cf*/ScbaF/SaF 75 mg/m <sup>3</sup> : Sa:F: Pd, Pp §: ScbaF: Pd, Pp/Sa:F: Pd, Pp: AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Acids, alkalis					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Throb head; dizz; nau, vomit, abdom pain; hypotension, flush, palp, angina; methemo; delirium, CNS depres; irrit skin; in animals: anemia; liver, kidney damage TO: Skin, CVS, blood, liver, kidneys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Ethyleneimine</b>		<b>Formula:</b> C <sub>2</sub> H <sub>5</sub> N	<b>CAS#:</b> 151-56-4	<b>RTECS#:</b> KX5075000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 1.76 mg/m <sup>3</sup>		<b>DOT:</b> 1185 131P (inhibited)			
<b>Synonyms/Trade Names:</b> Aminoethylene, Azirane, Aziridine, Dimethyleimine, Dimethylenimine, Ethyleneimine, Ethylimine					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1012] See Appendix B				<b>Measurement Methods (see Table 1):</b> NIOSH 3514	
<b>Physical Description:</b> Colorless liquid with an ammonia-like odor. [Note: Usually contains inhibitors to prevent polymerization.]					
<b>Chemical &amp; Physical Properties:</b> MW: 43.1 BP: 133°F Sol: Miscible F.L.P.: 12°F IP: 9.20 eV Sp.Gr: 0.83 VP: 160 mmHg FRZ: -97°F UEL: 54.8% LEL: 3.3% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Polymerizes explosively in presence of acids [Note: Explosive silver derivatives may be formed with silver alloys (e.g., silver solder).]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; nau, vomit; head, dizz; pulm edema; liver, kidney damage; eye burns; skin sens; [carc] TO: Eyes, skin, resp sys, liver, kidneys [in animals: lung & liver tumors]				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Ethylene oxide</b>	<b>Formula:</b> C <sub>2</sub> H <sub>4</sub> O	<b>CAS#:</b> 75-21-8	<b>RTECS#:</b> KX2450000	<b>IDLH:</b> Ca [800 ppm]
<b>Conversion:</b> 1 ppm = 1.80 mg/m <sup>3</sup>		<b>DOT:</b> 1040 119P		
<b>Synonyms/Trade Names:</b> Dimethylene oxide; 1,2-Epoxy ethane; Oxirane				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA <0.1 ppm (0.18 mg/m <sup>3</sup> ) C 5 ppm (9 mg/m <sup>3</sup> ) [10-min/day] See Appendix A OSHA PEL: [1910.1047] TWA 1 ppm 5 ppm [15-minute Excursion]			<b>Measurement Methods</b> (see Table 1): NIOSH 1614, 3800 OSHA 30, 49, 50	
<b>Physical Description:</b> Colorless gas or liquid (below 51°F) with an ether-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 44.1 BP: 51°F Sol: Miscible Fl.P: NA (Gas) -20°F (Liquid) IP: 10.56 eV RGasD: 1.49 Sp.Gr: 0.82 (Liquid at 50°F) VP: 1.46 atm FRZ: -171°F UEL: 100% LEL: 3.0% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> When contam (liquid) <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench (liquid)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> GmFS†/ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS†/ScbaE  <b>See Appendix E</b> (page 351)
		<b>Incompatibilities and Reactivities:</b> Strong acids, alkalis & oxidizers; chlorides of iron, aluminum & tin; oxides of iron & aluminum; water		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, (liquid), Con SY: Irrit eyes, skin, nose, throat; peculiar taste; head; nau, vomit, diarr; dysp, cyan, pulm edema; drow, lass, inco; EKG abnor; eye, skin burns (liq or high vap conc); liquid: frostbite; repro effects; [carc]; in animals: convuls; liver, kidney damage TO: Eyes, skin, resp sys, liver, CNS, blood, kidneys, repro sys [peritoneal cancer, leukemia]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (liquid)	

<b>Ethylene thiourea</b>	<b>Formula:</b> C <sub>3</sub> H <sub>6</sub> N <sub>2</sub> S	<b>CAS#:</b> 96-45-7	<b>RTECS#:</b> NI9625000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> 1,3-Ethylene-2-thiourea; N,N-Ethylenethiourea; ETU; 2-Imidazolidine-2-thione				
<b>Exposure Limits:</b> NIOSH REL: Ca Use encapsulated form. See Appendix A			<b>Measurement Methods</b> (see Table 1): NIOSH 5011 OSHA 95	
<b>Physical Description:</b> White to pale-green, crystalline solid with a faint, amine odor. [Note: Used as an accelerator in the curing of polychloroprene & other elastomers.]				
<b>Chemical &amp; Physical Properties:</b> MW: 102.2 BP: 446-595°F Sol(86°F): 2% Fl.P: 486°F IP: 8.15 eV Sp.Gr: ? VP: 16 mmHg MLT: 392°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ✖: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE
		<b>Incompatibilities and Reactivities:</b> Acrolein		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; in animals: thickening of the skin; goiter; terato effects; [carc] TO: Eyes, skin, thyroid, repro sys [in animals: liver, thyroid & lymphatic sys tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Ethyl ether</b>		<b>Formula:</b> C <sub>2</sub> H <sub>5</sub> OC <sub>2</sub> H <sub>5</sub>	<b>CAS#:</b> 60-29-7	<b>RTECS#:</b> KI5775000	<b>IDLH:</b> 1900 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1155 127			
<b>Synonyms/Trade Names:</b> Diethyl ether, Diethyl oxide, Ethyl oxide, Ether, Solvent ether					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 400 ppm (1200 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1610 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a pungent, sweetish odor. [Note: A gas above 94°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 94°F Sol: 8% Fl.P: -49°F IP: 9.53 eV Sp.Gr: 0.71 VP: 440 mmHg FRZ: -177°F UEL: 36.0% LEL: 1.9% Class IA Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> OSHA 1900 ppm: CcrOv*/GmFov/PapRov*/Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, halogens, sulfur, sulfur compounds [Note: Tends to form explosive peroxides under influence of air and light.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; dizz, drow, head, excited, narco; nau, vomit TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Ethyl formate</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> OCHO	<b>CAS#:</b> 109-94-4	<b>RTECS#:</b> LQ8400000	<b>IDLH:</b> 1500 ppm
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1190 129			
<b>Synonyms/Trade Names:</b> Ethyl ester of formic acid, Ethyl methanoate					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (300 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (300 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1452 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 130°F Sol(64°F): 9% Fl.P: -4°F IP: 10.61 eV Sp.Gr: 0.92 VP: 200 mmHg FRZ: -113°F UEL: 16.0% LEL: 2.8% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 1500 ppm: Sa: Cf£/PapRov£/CcrFov/ GmFov/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids [Note: Decomposes slowly in water to form ethyl alcohol and formic acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, upper resp sys; in animals: narco TO: Eyes, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Ethylidene norbornene</b>		<b>Formula:</b> C <sub>9</sub> H <sub>12</sub>	<b>CAS#:</b> 16219-75-3	<b>RTECS#:</b> RB9450000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.92 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> ENB, 5-Ethylidenebicyclo(2.2.1)hept-2-ene, 5-Ethylidene-2-norbornene [Note: Due to its reactivity, ENB may be stabilized with tert-butyl catechol.]					
<b>Exposure Limits:</b> NIOSH REL: C 5 ppm (25 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to white liquid with a turpentine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 120.2 BP: 298°F Sol: ? Fl.P(oc): 101°F IP: ? Sp.Gr: 0.90 VP: 4 mmHg FRZ: -112°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxygen [Note: ENB should be stored in a nitrogen atmosphere since it reacts with oxygen.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; head; cough, dysp; nau, vomit; olfactory, taste changes; chemical pneu (aspir liquid); in animals: liver, kidney, urogenital inj; bone marrow effects TO: Eyes, skin, resp sys, CNS, liver, kidneys, urogenital system, bone marrow				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

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<b>Ethyl mercaptan</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> SH	<b>CAS#:</b> 75-08-1	<b>RTECS#:</b> KI9625000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 2.54 mg/m <sup>3</sup>		<b>DOT:</b> 2363 129			
<b>Synonyms/Trade Names:</b> Ethanethiol, Ethyl sulfhydrate, Mercaptoethane					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (1.3 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: C 10 ppm (25 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2542	
<b>Physical Description:</b> Colorless liquid with a strong, skunk-like odor. [Note: A gas above 95°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 62.1 BP: 95°F Sol: 0.7% Fl.P: -55°F IP: 9.29 eV Sp.Gr: 0.84 VP: 442 mmHg FRZ: -228°F UEL: 18.0% LEL: 2.8% Class IA Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 5 ppm: CcrOv/Sa 12.5 ppm: Sa:Cf/PapOv 25 ppm: CcrFOv/GmFOv/SaT:Cf/PapTOv/ ScbaF/SaF 500 ppm: Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Reacts violently with calcium hypochlorite.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit muc memb; head, nau; in animals: inco, lass; liver, kidney damage; cyan; narco TO: Eyes, resp sys, liver, kidneys, blood				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>N-Ethylmorpholine</b>		<b>Formula:</b> C <sub>4</sub> H <sub>9</sub> ONCH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 100-74-3	<b>RTECS#:</b> QE4025000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 4.71 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4-Ethylmorpholine					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (23 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 20 ppm (94 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH S146 (II-3)	
<b>Physical Description:</b> Colorless liquid with an ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 115.2 BP: 281°F Sol: Miscible Fl.P(oc): 90°F IP: ? Sp.Gr: 0.90 VP: 6 mmHg FRZ: -81°F UEL: ? LEL: ? Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>15%) Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>50 ppm:</b> CcrOv*/Sa* <b>100 ppm:</b> Sa:Cf*/PaprOv*/CcrFOv/ GmFOv/ScbaF/SaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong acids, strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose, throat; vis dist: corn edema, blue-gray vision, colored haloes TO: Eyes, resp sys				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Ethyl silicate</b>		<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> SiO <sub>4</sub>	<b>CAS#:</b> 78-10-4	<b>RTECS#:</b> VV9450000	<b>IDLH:</b> 700 ppm
<b>Conversion:</b> 1 ppm = 8.52 mg/m <sup>3</sup>		<b>DOT:</b> 1292 129			
<b>Synonyms/Trade Names:</b> Ethyl orthosilicate, Ethyl silicate (condensed), Tetraethoxysilane, Tetraethyl orthosilicate, Tetraethyl silicate					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (85 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (850 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH S264 (II-3)	
<b>Physical Description:</b> Colorless liquid with a sharp, alcohol-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 208.3 BP: 336°F Sol: Reacts Fl.P: 99°F IP: 9.77 eV Sp.Gr: 0.93 VP: 1 mmHg FRZ: -117°F UEL: ? LEL: ? Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>100 ppm:</b> Sa* <b>250 ppm:</b> Sa:Cf* <b>500 ppm:</b> ScbaF/SaF <b>700 ppm:</b> SaF:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, water [Note: Reacts with water to form a silicone adhesive (a milky-white mass).]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, nose; in animals: lac; dysp, pulm edema; tremor, narco; liver, kidney damage; anemia TO: Eyes, resp sys, liver, kidneys, blood, skin				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Fenamiphos</b>	<b>Formula:</b> C <sub>13</sub> H <sub>22</sub> NO <sub>3</sub> PS	<b>CAS#:</b> 22224-92-6	<b>RTECS#:</b> TB3675000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Ethyl 3-methyl-4-(methylthio)phenyl-(1-methylethyl)phosphoramidate, Nemacur®, Phenamiphos				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> [skin] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5600	
<b>Physical Description:</b> Off-white to tan, waxy solid. [insecticide] [Note: Found commercially as a granular ingredient (5-15%) or in an emulsifiable concentrate (400 g/l).]				
<b>Chemical &amp; Physical Properties:</b> MW: 303.4 BP: ? Sol: 0.03% Fl.P: ? IP: ? Sp.Gr: 1.14 VP: 0.00005 mmHg MLT: 121°F UEL: ? LEL: ?	<b>Personal Protection/Sanitization</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported [Note: May hydrolyze under alkaline conditions.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp TO: Resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Fensulfothion</b>	<b>Formula:</b> C <sub>17</sub> H <sub>17</sub> O <sub>4</sub> PS <sub>2</sub>	<b>CAS#:</b> 115-90-2	<b>RTECS#:</b> TF3850000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dasanit®, O,O-Diethyl O-(p-methylsulfinyl)phenyl)phosphorothioate; Terracur P®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Brown liquid or yellow oil. [pesticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 308.4 BP: ? Sol(77°F): 0.2% Fl.P: ? IP: ? Sp.Gr: 1.20 VP: ? FRZ: ? UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitization</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit skin; nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dys TO: Skin, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Fenthion</b>	<b>Formula:</b> C <sub>10</sub> H <sub>16</sub> O <sub>3</sub> PS	<b>CAS#:</b> 55-38-9	<b>RTECS#:</b> TF9625000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Baytex; Entex; O,O-Dimethyl O-3-methyl-4-methylthiophenyl phosphorothioate				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to brown liquid with a slight, garlic-like odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 278.3 BP: ? Sol: 0.006% F.I.P: NA IP: ? Sp.Gr: 1.25 VP: 0.0003 mmHg FRZ: 43°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irregularities; musc fasc; dysp TO: Resp sys, CNS, CVS, plasma chol			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Ferbam</b>	<b>Formula:</b> [(CH <sub>3</sub> ) <sub>2</sub> NCS <sub>2</sub> ] <sub>3</sub> Fe	<b>CAS#:</b> 14484-64-1	<b>RTECS#:</b> NO8750000	<b>IDLH:</b> 800 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> tris(Dimethyldithiocarbamate)iron, Ferric dimethyl dithiocarbamate				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL†: TWA 15 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> Dark brown to black, odorless solid. [fungicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 416.5 BP: Decomposes Sol: 0.01% F.I.P: ? IP: 7.72 eV Sp.Gr: ? VP: 0 mmHg (approx) MLT: >356°F (Decomposes) UEL: ? LEL: ? MEC: 55 g/m <sup>3</sup> Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>50 mg/m<sup>3</sup>:</b> Qm <b>100 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>250 mg/m<sup>3</sup>:</b> Sa:Cf*/PaprHie* <b>500 mg/m<sup>3</sup>:</b> 100F/SaT:Cf*/PaprTHie*/ ScbaF/SaF <b>800 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, moisture				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, resp tract; dermat; GI dist TO: Eyes, skin, resp sys, GI tract			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Ferrovanadium dust</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b>
		FeV	12604-58-9	LK2900000	500 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Ferrovanadium					
<b>Exposure Limits:</b> NIOSH REL*: TWA 1 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> [*Note: The REL also applies to Vanadium metal and Vanadium carbide.] OSHA PEL†: TWA 1 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): OSHA ID121, ID125G	
<b>Physical Description:</b> Dark, odorless particulate dispersed in air. [Note: Ferrovanadium metal is an alloy usually containing 50-80% vanadium.]					
<b>Chemical &amp; Physical Properties:</b> MW: 106.8 BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: 2696-2768°F UEL: NA LEL: NA MEC: 1.3 g/m <sup>3</sup> Metal: Noncombustible Solid, but dust may be an explosion hazard.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 5 mg/m <sup>3</sup> : Qm* 10 mg/m <sup>3</sup> : 95XQ*/Sa* 25 mg/m <sup>3</sup> : Sa:Cf*/PaprHie* 50 mg/m <sup>3</sup> : 100F/SaT:Cf*/PaprTHie*/ ScbaF/SaF 500 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Irrit eyes, resp sys; in animals: bron, pneu TO: Eyes, resp sys				<b>First Aid</b> (see Table 6): Eye: Irr immed Breath: Resp support	

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<b>Fibrous glass dust</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b>
				LK3651000	N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Fiber glas®, Fiberglass, Glass fibers, Glass wool [Note: Usually produced from borosilicate & low alkali silicate glasses.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 3 fibers/cm <sup>3</sup> (fibers ≤ 3.5 µm in diameter & ≤ 10 µm in length) TWA 5 mg/m <sup>3</sup> (total) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods</b> (see Table 1): NIOSH 7400	
<b>Physical Description:</b> Typically, glass filaments >3 µm in diameter or glass "wool" with diameters down to 0.05 µm & >1 µm in length.					
<b>Chemical &amp; Physical Properties:</b> MW: NA BP: NA Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 2.5 VP: 0 mmHg (approx) MLT: ? UEL: NA LEL: NA Noncombustible Fibers		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: N.R. Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 5X REL: Qm 10X REL: 95XQ/Sa 25X REL: Sa:Cf/PaprHie 50X REL: 100F/PaprTHie/ScbaF/SaF 1000X REL: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Irrit eyes, skin, nose, throat; dysp TO: Eyes, skin, resp sys				<b>First Aid</b> (see Table 6): Eye: Irr immed Breath: Fresh air	

<b>Fluorine</b>		<b>Formula:</b> F <sub>2</sub>	<b>CAS#:</b> 7782-41-4	<b>RTECS#:</b> LM6475000	<b>IDLH:</b> 25 ppm
<b>Conversion:</b> 1 ppm = 1.55 mg/m <sup>3</sup>		<b>DOT:</b> 1045 124; 9192 167 (cryogenic liquid)			
<b>Synonyms/Trade Names:</b> Fluorine-19					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.2 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 0.1 ppm (0.2 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Pale-yellow to greenish gas with a pungent, irritating odor.					
<b>F</b> <b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 38.0 <b>BP:</b> -307°F <b>Sol:</b> Reacts <b>F.I.P.:</b> NA <b>IP:</b> 15.70 eV <b>RGasD:</b> 1.31 <b>VP:</b> >1 atm <b>FRZ:</b> -363°F <b>UEL:</b> NA <b>LEL:</b> NA Nonflammable Gas, but an extremely strong oxidizer.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> When contam (liquid) <b>Remove:</b> When wet or contam (liquid) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (liquid)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1 ppm:</b> Sa* <b>2.5 ppm:</b> Sa:Cf* <b>5 ppm:</b> ScbaF/SaF <b>25 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE		
	<b>Incompatibilities and Reactivities:</b> Water, nitric acid, oxidizers, organic compounds [Note: Reacts violently with all combustible materials, except the metal containers in which it is shipped. Reacts with H <sub>2</sub> O to form hydrofluoric acid.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, nose, resp sys; lar spasm, wheez; pulm edema; eye, skin burns; in animals: liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, liver, kidneys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support		

<b>Fluorotrichloromethane</b>		<b>Formula:</b> CCl <sub>3</sub> F	<b>CAS#:</b> 75-69-4	<b>RTECS#:</b> PB6125000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 5.62 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Freon® 11, Monofluorotrichloromethane, Refrigerant 11, Trichlorofluoromethane, Trichloromonofluoromethane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 1000 ppm (5600 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 1000 ppm (5600 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1006	
<b>Physical Description:</b> Colorless to water-white, nearly odorless liquid or gas (above 75°F).					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 137.4 <b>BP:</b> 75°F <b>Sol(75°F):</b> 0.1% <b>F.I.P.:</b> NA <b>IP:</b> 11.77 eV <b>RGasD:</b> 4.74 <b>Sp.Gr:</b> 1.47 (Liquid at 75°F) <b>VP:</b> 690 mmHg <b>FRZ:</b> -168°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Liquid Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> N.R. <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE		
	<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc, magnesium & lithium shavings; granular barium				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Inco, tremor; derm; card arrhy, card arrest; asphy; liquid: frostbite <b>TO:</b> Skin, resp sys, CVS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Fluoroxene</b>		<b>Formula:</b> CF <sub>3</sub> CH <sub>2</sub> OCH=CH <sub>2</sub>	<b>CAS#:</b> 406-90-6	<b>RTECS#:</b> KO4250000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.16 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2,2,2-Trifluoroethoxyethene; 2,2,2-Trifluoroethyl vinyl ether					
<b>Exposure Limits:</b> NIOSH REL*: C 2 ppm (10.3 mg/m <sup>3</sup> ) [60-minute] [*Note: REL for exposure to waste anesthetic gas.] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Liquid. [inhalation anesthetic] [ <b>Note:</b> A gas above 109°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 126.1 BP: 109°F Sol: ? Fl.P: ? IP: ? Sp.Gr: 1.14 VP: 286 mmHg FRZ: ? UEL: ? LEL: ? Combustible Liquid [Potentially EXPLOSIVE!]		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; CNS depres, analgesia, anes, convuls, resp depres TO: Eyes, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

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<b>Fonofos</b>		<b>Formula:</b> C <sub>10</sub> H <sub>15</sub> OPS <sub>2</sub>	<b>CAS#:</b> 944-22-9	<b>RTECS#:</b> TA5950000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 10.07 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dyfonate®, Dyphonate, O-Ethyl-S-phenyl ethylphosphorothioate, Fonofos					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 5600 OSHA PV2027	
<b>Physical Description:</b> Light-yellow liquid with an aromatic odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 246.3 BP: ? Sol: 0.001% Fl.P: >201°F IP: ? Sp.Gr: 1.15 VP(77°F): 0.0002 mmHg FRZ: ? UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp TO: Resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Formaldehyde</b>		<b>Formula:</b> HCHO	<b>CAS#:</b> 50-00-0	<b>RTECS#:</b> LP8925000	<b>IDLH:</b> Ca [20 ppm]
<b>Conversion:</b> 1 ppm = 1.23 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Methanal, Methyl aldehyde, Methylene oxide					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.016 ppm C 0.1 ppm [15-minute] See Appendix A OSHA PEL: [1910.1048] TWA 0.75 ppm ST 2 ppm			<b>Measurement Methods</b> (see Table 1): NIOSH 2016, 2541, 3500, 3800 OSHA ID205, 52		
<b>Physical Description:</b> Nearly colorless gas with a pungent, suffocating odor. [Note: Often used in an aqueous solution (see specific listing for Formalin).]					
<b>Chemical &amp; Physical Properties:</b> MW: 30.0 BP: -6°F Sol: Miscible F.I.P: NA (Gas) IP: 10.88 eV RGasD: 1.04 VP: >1 atm FRZ: -134°F UEL: 73% LEL: 7.0% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE  See Appendix E (page 351)	
		<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis & acids; phenols; urea [Note: Pure formaldehyde has a tendency to polymerize. Reacts with HCl to form bis-Chloromethyl ether.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, throat, resp sys; lac; cough; wheez; [carc] TO: Eyes, resp sys [nasal cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Resp support		

<b>Formalin (as formaldehyde)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> Ca [20 ppm]
<b>Conversion:</b>		<b>DOT:</b> 1198 132; 2209 132			
<b>Synonyms/Trade Names:</b> Formaldehyde solution [Note: Formalin is an aqueous solution that is 37% formaldehyde by weight; inhibited solutions usually contain 6-12% methyl alcohol. Also see specific listings for Formaldehyde and Methyl alcohol.]					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.016 ppm C 0.1 ppm [15-minute] See Appendix A			<b>OSHA PEL:</b> [1910.1048] TWA 0.75 ppm ST 2 ppm		
<b>Measurement Methods</b> (see Table 1): NIOSH 2016, 2541, 3500, 3800 OSHA ID205, 52					
<b>Physical Description:</b> Colorless liquid with a pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: Varies BP: 214°F Sol: Miscible F.I.P: 185°F IP: ? Sp.Gr(77°F): 1.08 VP: 1 mmHg FRZ: ? UEL: 73% LEL: 7% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE  See Appendix E (page 351)	
		<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis & acids; phenols; urea; oxides; isocyanates; caustics; anhydrides			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, throat, resp sys; lac; cough; wheez; derm; [carc] TO: Eyes, skin, resp sys [nasal cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

<b>Formamide</b>	<b>Formula:</b> HCONH <sub>2</sub>	<b>CAS#:</b> 75-12-7	<b>RTECS#:</b> LQ0525000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 1.85 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Carbamaldehyde, Methanamide				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (15 mg/m <sup>3</sup> ) [skin] OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless, oily liquid. [Note: A solid below 37°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 45.1 BP: 411°F (Decomposes) Sol: Miscible Fl.P(oc): 310°F IP: 10.20 eV Sp.Gr: 1.13 VP(86°F): 0.1 mmHg FRZ: 37°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, iodine, pyridine, sulfur trioxide, copper, brass, lead [Note: Hygroscopic (i.e., absorbs moisture from the air).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; drow, lass; nau; acidosis; skin eruptions; in animals: repro effects TO: Eyes, skin, resp sys, CNS, repro sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash Breath: Resp support Swallow: Medical attention immed		

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<b>Formic acid</b>	<b>Formula:</b> HCOOH	<b>CAS#:</b> 64-18-6	<b>RTECS#:</b> LQ4900000	<b>IDLH:</b> 30 ppm
<b>Conversion:</b> 1 ppm = 1.88 mg/m <sup>3</sup>		<b>DOT:</b> 1779 153		
<b>Synonyms/Trade Names:</b> Formic acid (85-95% in aqueous solution); Hydrogen carboxylic acid; Methanoic acid				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (9 mg/m <sup>3</sup> ) OSHA PEL: TWA 5 ppm (9 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 2011 OSHA ID186SG	
<b>Physical Description:</b> Colorless liquid with a pungent, penetrating odor. [Note: Often used in an aqueous solution.]				
<b>Chemical &amp; Physical Properties:</b> MW: 46.0 BP: 224°F (90% solution) Sol: Miscible Fl.P(oc): 122°F (90% solution) IP: 11.05 eV Sp.Gr: 1.22 (90% solution) VP: 35 mmHg FRZ: 20°F (90% solution) UEL: 57% (90% solution) LEL: 18% (90% solution) Class II Combustible Liquid (90% solution)	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 30 ppm: Sa*/ScbaF §: ScbaF:Pd,Pp/ SaF:Pd,Pp;AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics, concentrated sulfuric acid [Note: Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; skin, throat; skin burns, dermatitis; lac; rhin; cough, dysp; nau TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Furfural</b>		<b>Formula:</b> C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>	<b>CAS#:</b> 98-01-1	<b>RTECS#:</b> LT7000000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 3.93 mg/m <sup>3</sup>		<b>DOT:</b> 1199 132P			
<b>Synonyms/Trade Names:</b> Fural, 2-Furancarboxaldehyde, Furfuraldehyde, 2-Furfuraldehyde					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 5 ppm (20 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2529 OSHA 72	
<b>Physical Description:</b> Colorless to amber liquid with an almond-like odor. [Note: Darkens in light and air.]					
<b>Chemical &amp; Physical Properties:</b> MW: 96.1 BP: 323°F Sol: 8% Fl.P: 140°F IP: 9.21 eV Sp.Gr: 1.16 VP: 2 mmHg FRZ: -34°F UEL: 19.3% LEL: 2.1% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>50 ppm:</b> CcrOv*/Sa* <b>100 ppm:</b> Sa:Cf*/CcrFOv/PapOv*/GmFOv/ScbaF/SaF ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids, oxidizers, strong alkalis [Note: May polymerize on contact with strong acids or strong alkalis.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys; head; derm TO: Eyes, skin, resp sys				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Furfuryl alcohol</b>		<b>Formula:</b> C <sub>5</sub> H <sub>6</sub> O <sub>2</sub>	<b>CAS#:</b> 98-00-0	<b>RTECS#:</b> LU9100000	<b>IDLH:</b> 75 ppm
<b>Conversion:</b> 1 ppm = 4.01 mg/m <sup>3</sup>		<b>DOT:</b> 2874 153			
<b>Synonyms/Trade Names:</b> 2-Furylmethanol, 2-Hydroxymethylfuran					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (40 mg/m <sup>3</sup> ) [skin] ST 15 ppm (60 mg/m <sup>3</sup> ) OSHA PEL†: TWA 50 ppm (200 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2505	
<b>Physical Description:</b> Colorless to amber liquid with a faint, burning odor. [Note: Darkens on exposure to light.]					
<b>Chemical &amp; Physical Properties:</b> MW: 98.1 BP: 338°F Sol: Miscible Fl.P: 149°F IP: ? Sp.Gr: 1.13 VP(77°F): 0.6 mmHg FRZ: 6°F UEL: 16.3% LEL: 1.8% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>75 ppm:</b> CcrOv*/GmFOv/PapOv*/Sa*/ScbaF ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers & acids [Note: Contact with organic acids may lead to polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, muc memb; dizz; nau, diarr; diuresis; resp, body temperature depres; vomit; derm TO: Eyes, skin, resp sys, CNS				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Gasoline</b>	<b>Formula:</b>	<b>CAS#:</b> 8006-61-9	<b>RTECS#:</b> LX3300000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 4.5 mg/m <sup>3</sup> (approx)		<b>DOT:</b> 1203 128		
<b>Synonyms/Trade Names:</b> Motor fuel, Motor spirits, Natural gasoline, Petrol [ <b>Note:</b> A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>OSHA</b> PV2028	
<b>Physical Description:</b> Clear liquid with a characteristic odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 110 (approx) <b>BP:</b> 102°F <b>Sol:</b> Insoluble <b>Fl.P:</b> -45°F <b>IP:</b> ? <b>Sp.Gr(60°F):</b> 0.72-0.76 <b>VP:</b> 38-300 mmHg <b>FRZ:</b> ? <b>UEL:</b> 7.6% <b>LEL:</b> 1.4% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers such as peroxides, nitric acid & perchlorates				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; derm; head, lass, blurred vision, dizz, slurred speech, conf, convuls; chemical pneu (aspir liquid); possible liver, kidney damage; [carc] <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys [in animals: liver & kidney cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Germanium tetrahydride</b>	<b>Formula:</b> GeH <sub>4</sub>	<b>CAS#:</b> 7782-65-2	<b>RTECS#:</b> LY4900000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.13 mg/m <sup>3</sup>		<b>DOT:</b> 2192 119		
<b>Synonyms/Trade Names:</b> Germane, Germanium hydride, Germanomethane, Monogermane [ <b>Note:</b> Used chiefly for the production of high purity germanium for use in semiconductors.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.2 ppm (0.6 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a pungent odor. [ <b>Note:</b> Shipped as a compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 76.6 <b>BP:</b> -127°F <b>Sol:</b> Insoluble <b>Fl.P:</b> NA (Gas) <b>IP:</b> 11.34 eV <b>RGasD:</b> 2.65 <b>VP:</b> >1 atm <b>FRZ:</b> -267°F <b>UEL:</b> ? <b>LEL:</b> ? Flammable Gas (may ignite SPONTANEOUSLY in air).		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Bromine				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh <b>SY:</b> Mal, head, dizz, fainting; dysp; nau, vomit; kidney inj; hemolytic effects <b>TO:</b> CNS, kidneys, blood			<b>First Aid (see Table 6):</b> <b>Breath:</b> Resp support	

<b>Glutaraldehyde</b>	<b>Formula:</b> OCH(CH <sub>2</sub> ) <sub>3</sub> CHO	<b>CAS#:</b> 111-30-8	<b>RTECS#:</b> MA2450000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.09 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Glutaric dialdehyde; 1,5-Pentanedial				
<b>Exposure Limits:</b> NIOSH REL: C 0.2 ppm (0.8 mg/m <sup>3</sup> ) See Appendix C (Aldehydes) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 2532 OSHA 64	
<b>Physical Description:</b> Colorless liquid with a pungent odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 100.1 BP: 212°F Sol: Miscible Fl.P: NA IP: ? Sp.Gr: 1.10 VP: 17 mmHg FRZ: 7°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong bases [Note: Alkaline solutions of glutaraldehyde (i.e., activated glutaraldehyde) react with alcohol, ketones, amines, hydrazines & proteins.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; dermat, sens skin; cough, asthma; nau, vomit TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Glycerin (mist)</b>	<b>Formula:</b> HOCH <sub>2</sub> CH(OH)CH <sub>2</sub> OH	<b>CAS#:</b> 56-81-5	<b>RTECS#:</b> MA8050000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Glycerin (anhydrous); Glycerol; Glycyl alcohol; 1,2,3-Propanetriol; Trihydroxypropane				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> Clear, colorless, odorless, syrupy liquid or solid (below 64°F). [Note: The solid form melts above 64°F but the liquid form freezes at a much lower temperature.]				
<b>Chemical &amp; Physical Properties:</b> MW: 92.1 BP: 554°F (Decomposes) Sol: Miscible Fl.P: 320°F IP: ? Sp.Gr: 1.26 VP(122°F): 0.003 mmHg MLT: 64°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., chromium trioxide, potassium chlorate, potassium permanganate) [Note: Hygroscopic (i.e., absorbs moisture from the air).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; head, nau, vomit; kidney inj TO: Eyes, skin, resp sys, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash <b>Breath:</b> Fresh air	

<b>Glycidol</b>	<b>Formula:</b> C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	<b>CAS#:</b> 556-52-5	<b>RTECS#:</b> UB4375000	<b>IDLH:</b> 150 ppm
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> 2,3-Epoxy-1-propanol; Epoxypropyl alcohol; Glycide; Hydroxymethyl ethylene oxide; 2-Hydroxymethyl oxiran; 3-Hydroxypropylene oxide				
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (75 mg/m <sup>3</sup> ) OSHA PEL†: TWA 50 ppm (150 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1608 OSHA 7	
<b>Physical Description:</b> Colorless liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 320°F (Decomposes) Sol: Miscible Fl.P: 162°F IP: ? Sp.Gr: 1.12 VP(77°F): 0.9 mmHg FRZ: -49°F UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>150 ppm:</b> Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, nitrates				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; narco TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

G

<b>Glycolonitrile</b>	<b>Formula:</b> HOCH <sub>2</sub> CN	<b>CAS#:</b> 107-16-4	<b>RTECS#:</b> AM0350000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.34 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Cyanomethanol, Formaldehyde cyanohydrin, Glycolic nitrile, Glyconitrile, Hydroxyacetonitrile				
<b>Exposure Limits:</b> NIOSH REL: C 2 ppm (5 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless, odorless, oily liquid. [Note: Forms cyanide in the body.]				
<b>Chemical &amp; Physical Properties:</b> MW: 57.1 BP: 361°F (Decomposes) Sol: Soluble Fl.P: ? IP: ? Sp.Gr(66°F): 1.10 VP(145°F): 1 mmHg FRZ: <-98°F UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>20 ppm:</b> Sa <b>50 ppm:</b> Sa:Cf <b>100 ppm:</b> ScbaF/SaF <b>250 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Traces of alkalis (promote violent polymerization)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz, lass, conf, convuls; dysp; abdom pain, nau, vomit TO: Eyes, skin, resp sys, CNS, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Grain dust (oat, wheat, barley)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> MD7900000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> None [ <b>Note:</b> Grain dust consists of 60-75% organic materials (cereal grains) & 25-40% inorganic materials (soil), and includes fertilizers, pesticides & microorganisms.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 4 mg/m <sup>3</sup> OSHA PEL: TWA 10 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 0500	
<b>Physical Description:</b> Mixture of grain and all the other substances associated with its cultivation & harvesting.					
<b>G</b> <b>Chemical &amp; Physical Properties:</b> Properties depend upon the specific component of the grain dust.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> Daily			<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
	<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; cough, dysp, wheez, asthma, bron, chronic obstructive pulm disease; conj, derm, rhinitis, grain fever <b>TO:</b> Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Graphite (natural)</b>		<b>Formula:</b> C	<b>CAS#:</b> 7782-42-5	<b>RTECS#:</b> MD9659600	<b>IDLH:</b> 1250 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Black lead, Mineral carbon, Plumbago, Silver graphite, Stove black [ <b>Note:</b> Also see specific listing for Graphite (synthetic).]					
<b>Exposure Limits:</b> NIOSH REL: TWA 2.5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mppcf				<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Steel gray to black, greasy feeling, odorless solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 12.0 BP: Sublimes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 2.0-2.25 VP: 0 mmHg (approx) MLT: 6602°F (Sublimes) UEL: NA LEL: NA Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.			<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> 12.5 mg/m <sup>3</sup> : Qm 25 mg/m <sup>3</sup> : 95XQ/Sa 62.5 mg/m <sup>3</sup> : Papr/Hie/Sa:Cf 125 mg/m <sup>3</sup> : 100F/PaprTHie/SaT:Cf/ - ScbaF/SaF 1250 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Very strong oxidizers such as fluorine, chlorine trifluoride & potassium peroxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Cough, dysp, black sputum, decr pulm func, lung fib <b>TO:</b> Resp sys, CVS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Graphite (synthetic)</b>	<b>Formula:</b> C	<b>CAS#:</b> 7440-44-0 (synthetic)	<b>RTECS#:</b> FF5250100 (synthetic)	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Acheson graphite, Artificial graphite [Note: Also see specific listing for Graphite (natural).]				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Steel gray to black, greasy feeling, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 12.0 BP: Sublimes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 1.5-1.8 VP: 0 mmHg (approx) MLT: 6602°F (Sublimes) UEL: NA LEL: NA Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Very strong oxidizers such as fluorine, chlorine trifluoride & potassium peroxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Cough, dysp, black sputum, decr pulm func, lung fib TO: Resp sys, CVS			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air	

G

<b>Gypsum</b>	<b>Formula:</b> CaSO <sub>4</sub> ×2H <sub>2</sub> O	<b>CAS#:</b> 13397-24-5	<b>RTECS#:</b> MG2360000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Calcium(II) sulfate dihydrate, Gypsum stone, Hydrated calcium sulfate, Mineral white [Note: Gypsum is the dihydrate form of calcium sulfate; Plaster of Paris is the hemihydrate form.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> White or nearly white, odorless, crystalline solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 172.2 BP: ? Sol(77°F): 0.2% Fl.P: NA IP: NA Sp.Gr: 2.32 VP: 0 mmHg (approx) MLT: 262-325°F (Loses H <sub>2</sub> O) UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Aluminum (at high temperatures), diazomethane				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, muc memb, upper resp sys; cough, sneez, rhin TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air	

<b>Hafnium</b>	<b>Formula:</b> Hf	<b>CAS#:</b> 7440-58-6	<b>RTECS#:</b> MG4600000	<b>IDLH:</b> 50 mg/m <sup>3</sup> (as Hf)
<b>Conversion:</b>	<b>DOT:</b> 1326 170 (powder, wet); 2545 135 (powder, dry)			
<b>Synonyms/Trade Names:</b> Celtium, Elemental hafnium, Hafnium metal				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.5 mg/m <sup>3</sup> OSHA PEL*: TWA 0.5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other hafnium compounds (as Hf).]			<b>Measurement Methods</b> (see Table 1): NIOSH S194 (II-5) OSHA ID121	
<b>Physical Description:</b> Highly lustrous, ductile, grayish solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 178.5 BP: 8316°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 13.31 VP: 0 mmHg (approx) MLT: 4041°F UEL: NA LEL: NA Explosive in powder form (either dry or with <25% water); finely divided powder can be ignited by static electricity or even SPONTANEOUSLY.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2.5 mg/m<sup>3</sup>:</b> Qm <b>5 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>12.5 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie* <b>25 mg/m<sup>3</sup>:</b> 100F/SaT:C*/PaprTHie*/ ScbaF/SaF <b>50 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chlorine				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, skin, muc memb; liver damage TO: Eyes, skin, muc memb, liver		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Halothane</b>	<b>Formula:</b> CF <sub>3</sub> CHBrCl	<b>CAS#:</b> 151-67-7	<b>RTECS#:</b> KH6550000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 8.07 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1-Bromo-1-chloro-2,2,2-trifluoroethane; 2-Bromo-2-chloro-1,1,1-trifluoroethane; 1,1,1-Trifluoro-2-bromo-2-chloroethane; 2,2,2-Trifluoro-1-bromo-1-chloroethane				
<b>Exposure Limits:</b> NIOSH REL*: C 2 ppm (16.2 mg/m <sup>3</sup> ) [60-minute] [*Note: REL for exposure to waste anesthetic gas.] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): OSHA 29	
<b>Physical Description:</b> Clear, colorless liquid with a sweetish, pleasant odor. [inhalation anesthetic]				
<b>Chemical &amp; Physical Properties:</b> MW: 197.4 BP: 122°F Sol: 0.3% F.I.P: NA IP: ? Sp.Gr: 1.87 VP: 243 mmHg FRZ: -180°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> May attack rubber & some plastics; sensitive to light. [Note: Light causes decomposition. May be stabilized with 0.01% thymol.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; conf, drow, dizz, nau, analgesia, anes; card arrhy; liver, kidney damage; decr audio-visual performance; in animals: repro effects TO: Eyes, skin, resp sys, CVS, CNS, liver, kidneys, repro sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Heptachlor</b>	<b>Formula:</b> C <sub>10</sub> H <sub>5</sub> Cl <sub>7</sub>	<b>CAS#:</b> 76-44-8	<b>RTECS#:</b> PC0700000	<b>IDLH:</b> Ca [35 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 2761 151 (organochlorine pesticide, solid)			
<b>Synonyms/Trade Names:</b> 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.5 mg/m <sup>3</sup> [skin] See Appendix A OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH S287 (II-5) OSHA PV2029	
<b>Physical Description:</b> White to light-tan crystals with a camphor-like odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 373.4 BP: 293°F (Decomposes) Sol: 0.0006% F.I.P: NA IP: ? Sp.Gr: 1.66 VP(77°F): 0.0003 mmHg MLT: 203°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Iron, rust				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: In animals: tremor, convuls; liver damage; [carc] TO: CNS, liver [in animals: liver cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

H

<b>n-Heptane</b>	<b>Formula:</b> CH <sub>3</sub> [CH <sub>2</sub> ] <sub>5</sub> CH <sub>3</sub>	<b>CAS#:</b> 142-82-5	<b>RTECS#:</b> MI7700000	<b>IDLH:</b> 750 ppm
<b>Conversion:</b> 1 ppm = 4.10 mg/m <sup>3</sup>	<b>DOT:</b> 1206 128			
<b>Synonyms/Trade Names:</b> Heptane, normal-Heptane				
<b>Exposure Limits:</b> NIOSH REL: TWA 85 ppm (350 mg/m <sup>3</sup> ) C 440 ppm (1800 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: TWA 500 ppm (2000 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1500 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a gasoline-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 100.2 BP: 209°F Sol: 0.0003% F.I.P: 25°F IP: 9.90 eV Sp.Gr: 0.68 VP(72°F): 40 mmHg FRZ: -131°F UEL: 6.7% LEL: 1.05% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> 750 ppm: CcrOv/GmFOv/PapRov/ Sa/ScbaF §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Dizz, stupor, inco; loss of appetite, nau; derm; chemical pneu (aspir liquid); uncon TO: Skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1-Heptanethiol</b>		<b>Formula:</b> CH <sub>3</sub> [CH <sub>2</sub> ] <sub>6</sub> SH	<b>CAS#:</b> 1639-09-4	<b>RTECS#:</b> MJ1400000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.41 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131			
<b>Synonyms/Trade Names:</b> Heptyl mercaptan, n-Heptyl mercaptan					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (2.7 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a strong odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 132.3 BP: 351°F Sol: Insoluble Fl.P.: 115°F IP: ? Sp.Gr: 0.84 VP: ? FRZ: -46°F UEL: ? LEL: ? Class II Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/Pap/Ov <b>25 ppm:</b> CcrFOv/GmFOv/PapTOv/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; lass, cyan, incr respiration, nau, drow, head, vomit TO: Eyes, skin, resp sys, CNS, blood			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Hexachlorobutadiene</b>		<b>Formula:</b> Cl <sub>2</sub> C=CClCl=CCl <sub>2</sub>	<b>CAS#:</b> 87-68-3	<b>RTECS#:</b> EJ07000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 10.66 mg/m <sup>3</sup>		<b>DOT:</b> 2279 151			
<b>Synonyms/Trade Names:</b> HCBd; Hexachloro-1,3-butadiene; 1,3-Hexachlorobutadiene; Perchlorobutadiene					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.02 ppm (0.24 mg/m <sup>3</sup> ) [skin] See Appendix A OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 2543	
<b>Physical Description:</b> Clear, colorless liquid with a mild, turpentine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 260.7 BP: 419°F Sol: Insoluble Fl.P.: ? IP: ? Sp.Gr: 1.55 VP: 0.2 mmHg FRZ: -6°F UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: In animals: irrit eyes, skin, resp sys; kidney damage; [carc] TO: Eyes, skin, resp sys, kidneys [in animals: kidney tumors]			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Hexachlorocyclopentadiene</b>		<b>Formula:</b> C <sub>5</sub> Cl <sub>6</sub>	<b>CAS#:</b> 77-47-4	<b>RTECS#:</b> GY1225000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 11.16 mg/m <sup>3</sup>		<b>DOT:</b> 2646 151			
<b>Synonyms/Trade Names:</b> HCCPD; Hexachloro-1,3-cyclopentadiene; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene; Perchlorocyclopentadiene					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.01 ppm (0.1 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 2518	
<b>Physical Description:</b> Pale-yellow to amber-colored liquid with a pungent, unpleasant odor. [Note: A solid below 16°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 272.8 BP: 462°F Sol(77°F): 0.0002% (Reacts) Fl.P: NA IP: ? Sp.Gr: 1.71 VP(77°F): 0.08 mmHg FRZ: 16°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water, light [Note: Reacts slowly with water to form hydrochloric acid; will corrode iron & most metals in presence of moisture. Explosive hydrogen gas may collect in enclosed spaces in the presence of moisture.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; lac; sneez, cough, dysp, saly, pulm edema; nau, vomit, diarr; in animals: liver, kidney inj TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Hexachloroethane</b>		<b>Formula:</b> Cl <sub>2</sub> CCl <sub>2</sub>	<b>CAS#:</b> 67-72-1	<b>RTECS#:</b> KI4025000	<b>IDLH:</b> Ca [300 ppm]
<b>Conversion:</b> 1 ppm = 9.68 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Carbon hexachloride, Ethane hexachloride, Perchloroethane					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 1 ppm (10 mg/m <sup>3</sup> ) [skin] See Appendix A See Appendix C (Chloroethanes) OSHA PEL: TWA 1 ppm (10 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless crystals with a camphor-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 236.7 BP: Sublimes Sol(72°F): 0.005% Fl.P: NA IP: 11.22 eV Sp.Gr: 2.09 VP: 0.2 mmHg MLT: 368°F (Sublimes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ✖: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Alkalis; metals such as zinc, cadmium, aluminum, hot iron & mercury					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; in animals: kidney damage; [carc] TO: Eyes, skin, resp sys, kidneys [in animals: liver cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Hexachloronaphthalene</b>		<b>Formula:</b> C <sub>10</sub> H <sub>2</sub> Cl <sub>6</sub>	<b>CAS#:</b> 1335-87-1	<b>RTECS#:</b> QJ7350000	<b>IDLH:</b> 2 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Halowax® 1014					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.2 mg/m <sup>3</sup> [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH S100 (II-2)	
<b>Physical Description:</b> White to light-yellow solid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 334.9 BP: 650-730°F Sol: Insoluble F.I.P: NA IP: ? Sp.Gr: 1.78 VP: <1 mmHg MLT: 279°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2 mg/m<sup>3</sup>:</b> Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Acne-form derm, nau, conf, jaun, coma TO: Skin, liver			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1-Hexadecanethiol</b>		<b>Formula:</b> CH <sub>2</sub> [CH <sub>2</sub> ] <sub>14</sub> SH	<b>CAS#:</b> 2917-26-2	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 10.59 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131 (liquid)			
<b>Synonyms/Trade Names:</b> Cetyl mercaptan, Hexadecanethiol-1, n-Hexadecanethiol, Hexadecyl mercaptan					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (5.3 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid or solid (below 64-68°F) with a strong odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 258.5 BP: ? Sol: Insoluble F.I.P: 215°F IP: ? Sp.Gr: 0.85 VP: 0.1 mmHg FRZ: 64-68°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa: Cf/PaprvOv <b>25 ppm:</b> CcrFOv/GmFOv/PaprvTOv/ ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong acids & bases, alkali metals, reducing agents					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz, lass, cyan, nau, convuls TO: Eyes, skin, resp sys, CNS, blood			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Hexafluoroacetone</b>	<b>Formula:</b> (CF <sub>3</sub> ) <sub>2</sub> CO	<b>CAS#:</b> 684-16-2	<b>RTECS#:</b> UC2450000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.79 mg/m <sup>3</sup>	<b>DOT:</b> 2420 125			
<b>Synonyms/Trade Names:</b> Hexafluoro-2-propanone; 1,1,1,3,3,3-Hexafluoro-2-propanone; HFA; Perfluoroacetone				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.7 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless gas with a musty odor. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 166.0 <b>BP:</b> -18°F <b>Sol:</b> Reacts <b>F.I.P:</b> NA <b>IP:</b> 11.81 eV <b>RGasD:</b> 5.76 <b>VP:</b> 5.8 atm <b>FRZ:</b> -188°F <b>UEL:</b> NA <b>LEL:</b> NA Nonflammable Gas, but highly reactive with water & other substances, releasing heat.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact/Frostbite <b>Eyes:</b> Prevent eye contact/Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
		<b>Incompatibilities and Reactivities:</b> Water, acids [Note: Hygroscopic (i.e., absorbs moisture from the air); reacts with moisture to form a highly acidic sesquihydrate.]		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Con <b>SY:</b> Irrit eyes, skin, muc memb, resp sys; pulm edema; liquid; frostbite; in animals: terato, repro effects; kidney inj <b>TO:</b> Eyes, skin, resp sys, kidneys, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

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<b>Hexamethylene diisocyanate</b>	<b>Formula:</b> OCN[CH <sub>2</sub> ] <sub>6</sub> NCO	<b>CAS#:</b> 822-06-0	<b>RTECS#:</b> MO1740000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.88 mg/m <sup>3</sup>	<b>DOT:</b> 2281 156			
<b>Synonyms/Trade Names:</b> 1,6-Diisocyanatohexane; HDI; Hexamethylene-1,6-diisocyanate; 1,6-Hexamethylene diisocyanate; HMDI				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.005 ppm (0.035 mg/m <sup>3</sup> ) C 0.020 ppm (0.140 mg/m <sup>3</sup> ) [10-minute] <b>OSHA PEL:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 5521, 5522, 5525 <b>OSHA</b> 42	
<b>Physical Description:</b> Clear, colorless to slightly yellow liquid with a sharp, pungent odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 168.2 <b>BP:</b> 415°F <b>Sol:</b> Low (Reacts) <b>F.I.P:</b> 284°F <b>IP:?</b> <b>Sp.Gr(77°F):</b> 1.04 <b>VP(77°F):</b> 0.5 mmHg <b>FRZ:</b> -89°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>0.05 ppm:</b> Sa* <b>0.125 ppm:</b> Sa:Cf* <b>0.25 ppm:</b> ScbaF/SaF <b>1 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Water, alcohols, strong bases, amines, carboxylic acids, organotin catalysts [Note: Reacts slowly with water to form carbon dioxide. Avoid heating above 392°F (polymerizes).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; cough, dysp, bron, wheez, pulm edema, asthma; corn damage, skin blisters <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Hexamethyl phosphoramidate</b>	<b>Formula:</b> [(CH <sub>3</sub> ) <sub>2</sub> N] <sub>3</sub> PO	<b>CAS#:</b> 680-31-9	<b>RTECS#:</b> TD0875000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Hexamethylphosphoric triamide, Hexamethylphosphorotriamide, HMPA, Tris(dimethylamino)phosphine oxide				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Clear, colorless liquid with an aromatic or mild, amine-like odor. [Note: A solid below 43°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 179.2 BP: 451°F Sol: Miscible Fl.P: 220°F IP: ? Sp.Gr: 1.03 VP: 0.03 mmHg FRZ: 43°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☈: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong acids, chemically-active metals (e.g., potassium, sodium, magnesium, zinc)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; dysp; abdom pain; [carc] TO: Eyes, skin, resp sys, CNS, GI tract [in animals: cancer of the nasal cavity]		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>n-Hexane</b>	<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 110-54-3	<b>RTECS#:</b> MN9275000	<b>IDLH:</b> 1100 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.53 mg/m <sup>3</sup>		<b>DOT:</b> 1208 128		
<b>Synonyms/Trade Names:</b> Hexane, Hexyl hydride, normal-Hexane				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (180 mg/m <sup>3</sup> ) OSHA PEL†: TWA 500 ppm (1800 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 1500, 3800 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a gasoline-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 86.2 BP: 156°F Sol: 0.002% Fl.P: -7°F IP: 10.18 eV Sp.Gr: 0.66 VP: 124 mmHg FRZ: -219°F UEL: 7.5% LEL: 1.1% Class IB Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 500 ppm: Sa* 1100 ppm: Sa:C*/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose; nau, head; peri neur: numb extremities, musc weak; derm; dizz; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS, PNS		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Hexane isomers (excluding n-Hexane)</b>		<b>Formula:</b> C <sub>6</sub> H <sub>14</sub>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.53 mg/m <sup>3</sup>		<b>DOT:</b> 1208 128			
<b>Synonyms/Trade Names:</b> Diethylmethylmethane; Diisopropyl; 2,2-Dimethylbutane; 2,3-Dimethylbutane; Isohexane; 2-Methylpentane; 3-Methylpentane [Note: Also see specific listing for n-Hexane.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (350 mg/m <sup>3</sup> ) C 510 ppm (1800 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL†:</b> none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Clear liquids with mild, gasoline-like odors. [Note: Includes all the isomers of hexane except n-hexane.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 86.2 <b>BP:</b> 122-145°F <b>Sol:</b> Insoluble <b>Fl.P:</b> -54 to 19°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.65-0.66 <b>VP:</b> ? <b>FRZ:</b> -245 to -148°F <b>UEL:</b> ? <b>LEL:</b> ? Class IB Flammable Liquids		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>1000 ppm:</b> Sa* <b>2500 ppm:</b> Sa:Cf* <b>5000 ppm:</b> SaT:Cf*/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; head, dizz; nau; chemical pneu (aspir liquid); derm <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>n-Hexanethiol</b>		<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>5</sub> SH	<b>CAS#:</b> 111-31-9	<b>RTECS#:</b> MO4550000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.83 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131			
<b>Synonyms/Trade Names:</b> 1-Hexanethiol, Hexyl mercaptan, n-Hexyl mercaptan, n-Hexylthiol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 0.5 ppm (2.7 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL:</b> none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with an unpleasant odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 118.2 <b>BP:</b> 304°F <b>Sol:</b> Insoluble <b>Fl.P:</b> 68°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.84 <b>VP:</b> ? <b>FRZ:</b> -113°F <b>UEL:</b> ? <b>LEL:</b> ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>5 ppm:</b> CrOv/Sa <b>12.5 ppm:</b> Sa:Cf/PapRov <b>25 ppm:</b> CrFOv/GmFOv/PapRTOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; lass, cyan, incr respiration, nau, drow, head, vomit <b>TO:</b> Eyes, skin, resp sys, CNS, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>2-Hexanone</b>		<b>Formula:</b> CH <sub>3</sub> CO[CH <sub>2</sub> ] <sub>3</sub> CH <sub>3</sub>	<b>CAS#:</b> 591-78-6	<b>RTECS#:</b> MP1400000	<b>IDLH:</b> 1600 ppm
<b>Conversion:</b> 1 ppm = 4.10 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Butyl methyl ketone, MBK, Methyl butyl ketone, Methyl n-butyl ketone					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (4 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (410 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1300, 2555 OSHA PV2031	
<b>Physical Description:</b> Colorless liquid with an acetone-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 100.2 BP: 262°F Sol: 2% F.P: 77°F IP: 9.34 eV Sp.Gr: 0.81 VP: 11 mmHg FRZ: -71°F UEL: 8% LEL: ? Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>10 ppm:</b> Sa <b>25 ppm:</b> Sa:Cf <b>50 ppm:</b> SaT:Cf/ScbaF/SaF <b>1600 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose; peri neur: lass, pares; dermat; head, drow TO: Eyes, skin, resp sys, CNS, PNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Hexone</b>		<b>Formula:</b> CH <sub>3</sub> COCH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 108-10-1	<b>RTECS#:</b> SA9275000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 4.10 mg/m <sup>3</sup>		<b>DOT:</b> 1245 127			
<b>Synonyms/Trade Names:</b> Isobutyl methyl ketone, Methyl isobutyl ketone, 4-Methyl 2-pentanone, MIBK					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (205 mg/m <sup>3</sup> ) ST 75 ppm (300 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (410 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1300, 2555 OSHA 1004	
<b>Physical Description:</b> Colorless liquid with a pleasant odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 100.2 BP: 242°F Sol: 2% F.P: 64°F IP: 9.30 eV Sp.Gr: 0.80 VP: 16 mmHg FRZ: -120°F UEL(200°F): 8.0% LEL(200°F): 1.2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>500 ppm:</b> CcrOv*/GmFOv/PaprTOv*/Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, potassium tert-butoxide					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; head, narco, coma; dermat; in animals: liver, kidney damage TO: Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>sec-Hexyl acetate</b>	<b>Formula:</b> C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	<b>CAS#:</b> 108-84-9	<b>RTECS#:</b> SA7525000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 5.90 mg/m <sup>3</sup>	<b>DOT:</b> 1233 130			
<b>Synonyms/Trade Names:</b> 1,3-Dimethylbutyl acetate; Methylisoamyl acetate				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (300 mg/m <sup>3</sup> ) OSHA PEL: TWA 50 ppm (300 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1450 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a mild, pleasant, fruity odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 144.2 BP: 297°F Sol: 0.08% Fl.P: 113°F IP: ? Sp.Gr: 0.86 VP: 3 mmHg FRZ: -83°F UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>500 ppm:</b> CcrOv*/GmFOv/PapRov*/Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; head; in animals: narco TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Hexylene glycol</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> COHCH <sub>2</sub> CHOHCH <sub>3</sub>	<b>CAS#:</b> 107-41-5	<b>RTECS#:</b> SA0810000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.83 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2,4-Dihydroxy-2-methylpentane; 2-Methyl-2,4-pentanediol; 4-Methyl-2,4-pentanediol; 2-Methylpentane-2,4-diol				
<b>Exposure Limits:</b> NIOSH REL: C 25 ppm (125 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA PV2101	
<b>Physical Description:</b> Colorless liquid with a mild, sweetish odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 118.2 BP: 388°F Sol: Miscible Fl.P: 209°F IP: ? Sp.Gr: 0.92 VP: 0.05 mmHg FRZ: -58°F (Sets to glass) UEL(est): 7.4% LEL(calc): 1.3% Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids [Note: Hygroscopic (i.e., absorbs moisture from the air).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz, nau, inco, CNS depres; derm, skin sens TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Hydrazine</b>	<b>Formula:</b> H <sub>2</sub> NNH <sub>2</sub>	<b>CAS#:</b> 302-01-2	<b>RTECS#:</b> MU7175000	<b>IDLH:</b> Ca [50 ppm]
<b>Conversion:</b> 1 ppm = 1.31 mg/m <sup>3</sup>		<b>DOT:</b> 2029 132 (anhydrous); 3293 152 (≤ 37% solution); 2030 153 (37-64% solution); 2029 132 (>64% solution)		
<b>Synonyms/Trade Names:</b> Diamine, Hydrazine (anhydrous), Hydrazine base				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca C 0.03 ppm (0.04 mg/m <sup>3</sup> ) [2-hour] See Appendix A <b>OSHA PEL†:</b> TWA 1 ppm (1.3 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 3503 <b>OSHA</b> 20, 108	
<b>Physical Description:</b> Colorless, fuming, oily liquid with an ammonia-like odor. [Note: A solid below 36°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 32.1 BP: 236°F Sol: Miscible F.I.P.: 99°F IP: 8.93 eV Sp.Gr: 1.01 VP: 10 mmHg FRZ: 36°F UEL: 98% LEL: 2.9% Class IC Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, hydrogen peroxide, nitric acid, metallic oxides, acids [Note: Can ignite SPONTANEOUSLY on contact with oxidizers or porous materials such as earth, wood & cloth.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; temporary blindness; dizz, nau; dermat; eye, skin burns; in animals: bron, pulm edema; liver, kidney damage; convuls; [carc] <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys [in animals: tumors of the lungs, liver, blood vessels & intestine]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Hydrogenated terphenyls</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>n</sub> ) <sub>3</sub>	<b>CAS#:</b> 61788-32-7	<b>RTECS#:</b> WZ6535000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 12.19 mg/m <sup>3</sup> (40% hydrogenated)		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Hydrogenated diphenylbenzenes, Hydrogenated phenylbiphenyls, Hydrogenated triphenyls [Note: Complex mixture of terphenyl isomers that are partially hydrogenated.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 ppm (5 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Clear, oily, pale-yellow liquids with a faint odor. [plasticizer/heat-transfer media]				
<b>Chemical &amp; Physical Properties:</b> MW: 298 (40% hydrogenated) BP: 644°F (40% hydrogenated) Sol: Insoluble F.I.P.: 315°F (40% hydrogenated) IP: ? Sp.Gr(77°F): 1.003-1.009 (40% hydrogenated) VP: ? FRZ: ? UEL: ? LEL: ? Class IIIB Combustible Liquids	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported [Note: When heated, irritating vapors will be released.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; liver, kidney, hemato damage <b>TO:</b> Eyes, skin, resp sys, liver, kidneys, hemato sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Hydrogen bromide</b>		<b>Formula:</b> HBr	<b>CAS#:</b> 10035-10-6	<b>RTECS#:</b> MW3850000	<b>IDLH:</b> 30 ppm	
<b>Conversion:</b> 1 ppm = 3.31 mg/m <sup>3</sup>		<b>DOT:</b> 1048 125 (anhydrous); 1788 154 (solution)				
<b>Synonyms/Trade Names:</b> Anhydrous hydrogen bromide; Aqueous hydrogen bromide (i.e., Hydrobromic acid)						
<b>Exposure Limits:</b> NIOSH REL: C 3 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: TWA 3 ppm (10 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 7903 OSHA ID165SG		
<b>Physical Description:</b> Colorless gas with a sharp, irritating odor. [Note: Shipped as a liquefied compressed gas. Often used in an aqueous solution.]						
<b>Chemical &amp; Physical Properties:</b> MW: 80.9 BP: -88°F Sol: 49% Fl.P: NA IP: 11.62 eV RGasD: 2.81 VP: 20 atm FRZ: -124°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (solution)/Frostbite <b>Eyes:</b> Prevent eye contact (solution)/Frostbite <b>Wash skin:</b> When contam (solution) <b>Remove:</b> When wet or contam (solution) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (solution) Frostbite wash			<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>30 ppm:</b> Sa:CfE/PapAgE/GmFAG/ ScaF/SaF <b>§:</b> ScaF: Pd,Pp/SaF: Pd,Pp: ASca <b>Escape:</b> GmFAG/ScaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics, moisture, copper, brass, zinc [Note: Hydrobromic acid is highly corrosive to most metals.]						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing (solution), Con SY: Irrit eyes, skin, nose, throat; solution: eye, skin burns; liquid: frostbite TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (solution)/Frostbite <b>Skin:</b> Water flush immed (solution)/Frostbite <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (solution)			

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<b>Hydrogen chloride</b>		<b>Formula:</b> HCl	<b>CAS#:</b> 7647-01-0	<b>RTECS#:</b> MW4025000	<b>IDLH:</b> 50 ppm	
<b>Conversion:</b> 1 ppm = 1.49 mg/m <sup>3</sup>		<b>DOT:</b> 1050 125 (anhydrous); 1789 157 (solution)				
<b>Synonyms/Trade Names:</b> Anhydrous hydrogen chloride; Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid) [Note: Often used in an aqueous solution.]						
<b>Exposure Limits:</b> NIOSH REL: C 5 ppm (7 mg/m <sup>3</sup> ) OSHA PEL: C 5 ppm (7 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 7903 OSHA ID174SG		
<b>Physical Description:</b> Colorless to slightly yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]						
<b>Chemical &amp; Physical Properties:</b> MW: 36.5 BP: -121°F Sol(86°F): 67% Fl.P: NA IP: 12.74 eV RGasD: 1.27 VP: 40.5 atm FRZ: -174°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (solution)/Frostbite <b>Eyes:</b> Prevent eye contact/Frostbite <b>Wash skin:</b> When contam (solution) <b>Remove:</b> When wet or contam (solution) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (solution) Quick drench (solution) Frostbite wash			<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>50 ppm:</b> CcrS*/GmFS/PapRS*/ Sa*/ScaF <b>§:</b> ScaF: Pd,Pp/SaF: Pd,Pp: ASca <b>Escape:</b> GmFAG/ScaE		
<b>Incompatibilities and Reactivities:</b> Hydroxides, amines, alkalis, copper, brass, zinc [Note: Hydrochloric acid is highly corrosive to most metals.]						
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing (solution), Con SY: Irrit nose, throat, larynx; cough, choking; derm; solution: eye, skin burns; liquid: frostbite; in animals: lar spasm; pulm edema TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (solution)/Frostbite <b>Skin:</b> Water flush immed (solution)/Frostbite <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (solution)			

<b>Hydrogen cyanide</b>	<b>Formula:</b> HCN	<b>CAS#:</b> 74-90-8	<b>RTECS#:</b> MW6825000	<b>IDLH:</b> 50 ppm
<b>Conversion:</b> 1 ppm = 1.10 mg/m <sup>3</sup>	<b>DOT:</b> 1051 117 (>20% solution); 1051 117 (anhydrous); 1613 154 (20% solution)			
<b>Synonyms/Trade Names:</b> Formonitrile, Hydrocyanic acid, Prussic acid				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> ST 4.7 ppm (5 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> TWA 10 ppm (11 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 6010, 6017	
<b>Physical Description:</b> Colorless or pale-blue liquid or gas (above 78°F) with a bitter, almond-like odor. [ <b>Note:</b> Often used as a 96% solution in water.]				
<b>Chemical &amp; Physical Properties:</b> MW: 27.0 BP: 78°F (96%) Sol: Miscible F.I.P.: 0°F (96%) IP: 13.60 eV Sp.Gr: 0.69 VP: 630 mmHg FRZ: 7°F (96%) UEL: 40.0% LEL: 5.6% Class IA Flammable Liquid Flammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>47 ppm:</b> Sa <b>50 ppm:</b> Sa:Cf/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Amines, oxidizers, acids, sodium hydroxide, calcium hydroxide, sodium carbonate, caustics, ammonia [ <b>Note:</b> Can polymerize at 122-140°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Asphy; lass, head, conf; nau, vomit; incr rate and depth of respiration or respiration slow and gasping; thyroid, blood changes <b>TO:</b> CNS, CVS, thyroid, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Hydrogen fluoride</b>	<b>Formula:</b> HF	<b>CAS#:</b> 7664-39-3	<b>RTECS#:</b> MW7875000	<b>IDLH:</b> 30 ppm
<b>Conversion:</b> 1 ppm = 0.82 mg/m <sup>3</sup>	<b>DOT:</b> 1052 125 (anhydrous); 1790 157 (solution)			
<b>Synonyms/Trade Names:</b> Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride (i.e., Hydrofluoric acid); HF-A				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 3 ppm (2.5 mg/m <sup>3</sup> ) C 6 ppm (5 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL†:</b> TWA 3 ppm			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 3800, 7902, 7903, 7906 <b>OSHA</b> ID110	
<b>Physical Description:</b> Colorless gas or fuming liquid (below 67°F) with a strong, irritating odor. [ <b>Note:</b> Shipped in cylinders.]				
<b>Chemical &amp; Physical Properties:</b> MW: 20.0 BP: 67°F Sol: Miscible F.I.P.: NA IP: 15.98 eV RGasD: 1.86 Sp.Gr: 1.00 (Liquid at 67°F) VP: 783 mmHg FRZ: -118°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> When contam (liquid) <b>Remove:</b> When wet or contam (liquid) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (liquid)		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>30 ppm:</b> CcrS*/PaprS*/GmFS/Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Metals, water or steam [ <b>Note:</b> Corrosive to metals. Will attack glass and concrete.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs (liquid), Ing (solution), Con <b>SY:</b> Irrit eyes, skin, nose, throat; pulm edema; eye, skin burns; rhinitis; bron; bone changes <b>TO:</b> Eyes, skin, resp sys, bones			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (solution/liquid) <b>Skin:</b> Water flush immed (solution/liquid) <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (solution)	

<b>Hydrogen peroxide</b>	<b>Formula:</b> H <sub>2</sub> O <sub>2</sub>	<b>CAS#:</b> 7722-84-1	<b>RTECS#:</b> MX0900000	<b>IDLH:</b> 75 ppm
<b>Conversion:</b> 1 ppm = 1.39 mg/m <sup>3</sup>	<b>DOT:</b> 2984 140 (8-20% solution); 2014 140 (20-60% solution); 2015 143 (>60% solution)			
<b>Synonyms/Trade Names:</b> High-strength hydrogen peroxide, Hydrogen dioxide, Hydrogen peroxide (aqueous), Hydroperoxide, Peroxide				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (1.4 mg/m <sup>3</sup> ) OSHA PEL: TWA 1 ppm (1.4 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> OSHA ID126SG	
<b>Physical Description:</b> Colorless liquid with a slightly sharp odor. [Note: The pure compound is a crystalline solid below 12°F. Often used in an aqueous solution.]				
<b>Chemical &amp; Physical Properties:</b> MW: 34.0 BP: 286°F Sol: Miscible F.I.P: NA IP: 10.54 eV Sp.Gr: 1.39 VP(86°F): 5 mmHg FRZ: 12°F UEL: NA LEL: NA Noncombustible Liquid, but a powerful oxidizer.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>10 ppm:</b> Sa* <b>25 ppm:</b> Sa: Cf* <b>50 ppm:</b> ScbaF/SaF <b>75 ppm:</b> SaF: Pd, Pp <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizable materials, iron, copper, brass, bronze, chromium, zinc, lead, silver, manganese [Note: Contact with combustible material may result in SPONTANEOUS combustion.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; corn ulcer; eryt, vesic skin; bleaching hair TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Hydrogen selenide</b>	<b>Formula:</b> H <sub>2</sub> Se	<b>CAS#:</b> 7783-07-5	<b>RTECS#:</b> MX1050000	<b>IDLH:</b> 1 ppm
<b>Conversion:</b> 1 ppm = 3.31 mg/m <sup>3</sup>	<b>DOT:</b> 2202 117 (anhydrous)			
<b>Synonyms/Trade Names:</b> Selenium dihydride, Selenium hydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 ppm (0.2 mg/m <sup>3</sup> ) OSHA PEL: TWA 0.05 ppm (0.2 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless gas with an odor resembling decayed horseradish. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 81.0 BP: -42°F Sol(73°F): 0.9% F.I.P: NA (Gas) IP: 9.88 eV RGasD: 2.80 VP(70°F): 9.5 atm FRZ: -87°F UEL: ? LEL: ? Flammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.5 ppm:</b> Sa <b>1 ppm:</b> Sa: Cf*/ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, water, halogenated hydrocarbons				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, throat; nau, vomit, diarr; metallic taste, garlic breath; dizz, lass; liquid: frostbite; in animals: pneu; liver damage TO: Eyes, resp sys, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Hydrogen sulfide</b>		<b>Formula:</b> H <sub>2</sub> S	<b>CAS#:</b> 7783-06-4	<b>RTECS#:</b> MX1225000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 1.40 mg/m <sup>3</sup>		<b>DOT:</b> 1053 117			
<b>Synonyms/Trade Names:</b> Hydrosulfuric acid, Sewer gas, Sulfuretted hydrogen					
<b>Exposure Limits:</b> NIOSH REL: C 10 ppm (15 mg/m <sup>3</sup> ) [10-minute] OSHA PEL†: C 20 ppm 50 ppm [10-minute maximum peak]				<b>Measurement Methods (see Table 1):</b> NIOSH 6013 OSHA ID141	
<b>Physical Description:</b> Colorless gas with a strong odor of rotten eggs. [Note: Sense of smell becomes rapidly fatigued & can NOT be relied upon to warn of the continuous presence of H <sub>2</sub> S. Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 34.1 BP: -77°F Sol: 0.4% Fl.P: NA (Gas) IP: 10.46 eV RGasD: 1.19 VP: 17.6 atm FRZ: -122°F UEL: 44.0% LEL: 4.0% Flammable Gas		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 100 ppm: PaprS/GmFS/Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong nitric acid, metals					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, resp sys; apnea, coma, convuls; conj, eye pain, lac, photo, corn vesic; dizz, head, lass, irrity, insom; GI dist; liquid: frostbite TO: Eyes, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Hydroquinone</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (OH) <sub>2</sub>	<b>CAS#:</b> 123-31-9	<b>RTECS#:</b> MX3500000	<b>IDLH:</b> 50 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 2662 153			
<b>Synonyms/Trade Names:</b> p-Benzenediol; 1,4-Benzenediol; Dihydroxybenzene; 1,4-Dihydroxybenzene; Quinol					
<b>Exposure Limits:</b> NIOSH REL: C 2 mg/m <sup>3</sup> [15-minute] OSHA PEL: TWA 2 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 5004 OSHA PV2094	
<b>Physical Description:</b> Light-tan, light-gray, or colorless crystals.					
<b>Chemical &amp; Physical Properties:</b> MW: 110.1 BP: 545°F Sol: 7% Fl.P: 329°F (Molten) IP: 7.95 eV Sp.Gr: 1.33 VP: 0.00001 mmHg MLT: 338°F UEL: ? LEL: ? Combustible Solid; dust cloud may explode if ignited in an enclosed area.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash (>7%)		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 50 mg/m <sup>3</sup> : PaprHie£/100F/SaT: Cf£/ ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; conj; kera; CNS excitement; colored urine, nau, dizz, suffocation, rapid breath; musc twitch, delirium; collapse; skin irrit, sens, derm TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush Breath: Resp support Swallow: Medical attention immed	

2-Hydroxypropyl acrylate		Formula: CH <sub>2</sub> =CHCOOCH <sub>2</sub> CHOHCH <sub>3</sub>	CAS#: 999-61-1	RTECS#: AT1925000	IDLH: N.D.
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> HPA, β-Hydroxypropyl acrylate, Propylene glycol monoacrylate					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 ppm (3 mg/m <sup>3</sup> ) [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Clear to light-yellow liquid with a sweetish, solvent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 130.2 BP: 376°F Sol: ? Fl.P: 149°F IP: ? Sp.Gr: 1.05 VP: ? FRZ: ? UEL: ? LEL: 1.8% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water [Note: Can become unstable at high temperatures & pressures or may react with water with some release of energy, but not violently.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; cough, dysp TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

Indene		Formula: C <sub>9</sub> H <sub>8</sub>	CAS#: 95-13-6	RTECS#: NK8225000	IDLH: N.D.
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Indonaphthene					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (45 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid. [Note: A solid below 29°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 359°F Sol: Insoluble Fl.P: 173°F IP: 8.81 eV Sp.Gr: 0.997 VP: ? FRZ: 29°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported [Note: Polymerizes & oxidizes on standing. It has exploded during nitration with (H <sub>2</sub> SO <sub>4</sub> + HNO <sub>3</sub> ).]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, skin, muc memb; derm, skin sens; chemical pneu (aspir liquid); liver, kidney, spleen inj TO: Eyes, skin, resp sys, liver, kidneys, spleen			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Indium</b>	<b>Formula:</b> In	<b>CAS#:</b> 7440-74-6	<b>RTECS#:</b> NL1050000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Indium metal				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.1 mg/m <sup>3</sup> [*Note: The REL also applies to other indium compounds (as In).] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 7303, P&CAM173 (II-5) OSHA ID121	
<b>Physical Description:</b> Ductile, shiny, silver-white metal that is softer than lead.				
<b>Chemical &amp; Physical Properties:</b> MW: 114.8 BP: 3767°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 7.31 VP: 0 mmHg (approx) MLT: 314°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but may ignite in powdered or dust form.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> (Dinitrogen tetraoxide + acetonitrile), mercury(II) bromide (at 662°F), sulfur (mixtures ignite when heated) [Note: oxidizes readily at higher temperatures.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; possible liver, kidney, heart, blood effects; pulm edema TO: Eyes, skin, resp sys, liver, kidneys, heart, blood			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

<b>Iodine</b>	<b>Formula:</b> I <sub>2</sub>	<b>CAS#:</b> 7553-56-2	<b>RTECS#:</b> NN1575000	<b>IDLH:</b> 2 ppm
<b>Conversion:</b> 1 ppm = 10.38 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Iodine crystals, Molecular iodine				
<b>Exposure Limits:</b> NIOSH REL: C 0.1 ppm (1 mg/m <sup>3</sup> ) OSHA PEL: C 0.1 ppm (1 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6005 OSHA ID212	
<b>Physical Description:</b> Violet solid with a sharp, characteristic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 253.8 BP: 365°F Sol: 0.01% F.I.P: NA IP: 9.31 eV Sp.Gr: 4.93 VP(77°F): 0.3 mmHg MLT: 236°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash (>7%) Quick drench (>7%)		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1 ppm: Sa* 2 ppm: Sa: Cf*/ScbaF/SaF ‡: ScbaF/Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFAg100/ScbaE
<b>Incompatibilities and Reactivities:</b> Ammonia, acetylene, acetaldehyde, powdered aluminum, active metals, liquid chlorine				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; lac; head; chest tight; skin burns, rash; cutaneous hypersensitivity TO: Eyes, skin, resp sys, CNS, CVS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Iodoform</b>		<b>Formula:</b> CHI <sub>3</sub>	<b>CAS#:</b> 75-47-8	<b>RTECS#:</b> PB7000000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 16.10 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Triiodomethane					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.6 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Yellow to greenish-yellow powder or crystalline solid with a pungent, disagreeable odor. [antiseptic for external use]					
<b>Chemical &amp; Physical Properties:</b> MW: 393.7 BP: 410°F (Decomposes) Sol: 0.01% Fl.P: NA IP: ? Sp.Gr: 4.01 VP: ? MLT: 246°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, lithium, metallic salts (e.g., mercuric oxide, silver nitrate), strong bases, calomel, tannin					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; lass, dizz, nau, inco, CNS depres; dysp; liver, kidney, heart damage; vis dist TO: Eyes, skin, resp sys, liver, kidneys, heart			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Iron oxide dust and fume (as Fe)</b>		<b>Formula:</b> Fe <sub>2</sub> O <sub>3</sub>	<b>CAS#:</b> 1309-37-1	<b>RTECS#:</b> NO7400000 NO7525000 (fume)	<b>IDLH:</b> 2500 mg/m <sup>3</sup> (as Fe)
<b>Conversion:</b>		<b>DOT:</b> 1376 135 (spent)			
<b>Synonyms/Trade Names:</b> Ferric oxide, Iron(III) oxide					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 10 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
<b>Physical Description:</b> Reddish-brown solid. [Note: Exposure to fume may occur during the arc-welding of iron.]					
<b>Chemical &amp; Physical Properties:</b> MW: 159.7 BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 5.24 VP: 0 mmHg (approx) MLT: 2664°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 50 mg/m <sup>3</sup> : 95XQ/Sa 125 mg/m <sup>3</sup> : Sa:Cf/PapR/Hie 250 mg/m <sup>3</sup> : 100F/SaT:Cf/PapR/THie/ ScbaF/SaF 2500 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Calcium hypochlorite					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis) TO: Resp sys				<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Iron pentacarbonyl (as Fe)</b>	<b>Formula:</b> Fe(CO) <sub>5</sub>	<b>CAS#:</b> 13463-40-6	<b>RTECS#:</b> NO4900000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.28 mg/m <sup>3</sup> (as Fe)	<b>DOT:</b> 1994 131			
<b>Synonyms/Trade Names:</b> Iron carbonyl, Pentacarbonyl iron				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.23 mg/m <sup>3</sup> ) ST 0.2 ppm (0.45 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless to yellow to dark-red, oily liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 195.9 BP(749 mmHg): 217°F Sol: Insoluble F.P.: 5°F IP: ? Sp.Gr: 1.46-1.52 VP(87°F): 40 mmHg FRZ: -6°F UEL: ? LEL: ? Class IB Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, nitrogen oxide, (zinc + cobalt halides) [Note: Pyrophoric (i.e., ignites spontaneously in air). Decomposed by light or air, releasing carbon monoxide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, muc memb, resp sys; head, dizz, nau, vomit; fever, cyan, cough, dysp; liver, kidney, lung inj; degenerative changes in CNS TO: Eyes, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Iron salts (soluble, as Fe)</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> FeSO <sub>4</sub> : Ferrous sulfate, Iron(II) sulfate; FeCl <sub>2</sub> : Ferrous chloride, Iron(II) chloride; Fe(NO <sub>3</sub> ) <sub>3</sub> : Ferric nitrate, Iron(III) nitrate; Fe(SO <sub>4</sub> ) <sub>3</sub> : Ferric sulfate, Iron(III) sulfate; FeCl <sub>3</sub> : Ferric chloride, Iron(III) chloride				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble iron salt.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble iron salt.  Noncombustible Solids	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> N.R. <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; abdom pain, diarr, vomit; possible liver damage TO: Eyes, skin, resp sys, liver, GI tract			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Isoamyl acetate</b>	<b>Formula:</b> CH <sub>3</sub> COOCH <sub>2</sub> CH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 123-92-2	<b>RTECS#:</b> NS9800000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>	<b>DOT:</b> 1104 129			
<b>Synonyms/Trade Names:</b> Banana oil, Isopentyl acetate, 3-Methyl-1-butanol acetate, 3-Methylbutyl ester of acetic acid, 3-Methylbutyl ethanoate				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (525 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 100 ppm (525 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1450 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a banana-like odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 130.2 <b>BP:</b> 288°F <b>Sol:</b> 0.3% <b>Fl.P:</b> 77°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.87 <b>VP:</b> 4 mmHg <b>FRZ:</b> -109°F <b>UEL:</b> 7.5% <b>LEL(212°F):</b> 1.0% Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> CcrOv/PaprOv/GmFOv/ Sa/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; dermat; in animals: narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Isoamyl alcohol (primary)</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 123-51-3	<b>RTECS#:</b> EL5425000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 3.61 mg/m <sup>3</sup>	<b>DOT:</b> 1105 129			
<b>Synonyms/Trade Names:</b> Fermentation amyl alcohol, Fusel oil, Isobutyl carbinol, Isopentyl alcohol, 3-Methyl-1-butanol, Primary isoamyl alcohol				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (360 mg/m <sup>3</sup> ) ST 125 ppm (450 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 100 ppm (360 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1402, 1405	
<b>Physical Description:</b> Colorless liquid with a disagreeable odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 88.2 <b>BP:</b> 270°F <b>Sol(57°F):</b> 2% <b>Fl.P:</b> 109°F <b>IP:</b> ? <b>Sp.Gr(57°F):</b> 0.81 <b>VP:</b> 28 mmHg <b>FRZ:</b> -179°F <b>UEL(212°F):</b> 9.0% <b>LEL:</b> 1.2% Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>500 ppm:</b> Sa:Cf£/CcrFOv/GmFOv/ PaprOv£/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; head, dizz; cough, dysp, nau, vomit, diarr; skin cracking; in animals: narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Isoamyl alcohol (secondary)</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHCH(OH)CH <sub>3</sub>	<b>CAS#:</b> 6032-29-7	<b>RTECS#:</b> SA4900000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 3.61 mg/m <sup>3</sup>		<b>DOT:</b> 1105 129			
<b>Synonyms/Trade Names:</b> 3-Methyl-2-butanol, Secondary isoamyl alcohol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (360 mg/m <sup>3</sup> ) ST 125 ppm (450 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 100 ppm (360 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1402</b>	
<b>Physical Description:</b> Colorless liquid with a disagreeable odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 88.2 <b>BP:</b> 234°F <b>Sol:</b> ? <b>Fl.P(oc):</b> 95°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.82 <b>VP:</b> 1 mmHg <b>FRZ:</b> ? <b>UEL:</b> ? <b>LEL:</b> ? Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>500 ppm:</b> Sa:Cf£/CcrFOv/GmFOv/ PapOv£/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; head, dizz; cough, dysp, nau, vomit, diarr; skin cracking; in animals: narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isobutane</b>		<b>Formula:</b> CH <sub>3</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 75-28-5	<b>RTECS#:</b> TZ4300000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.38 mg/m <sup>3</sup>		<b>DOT:</b> 1075 115; 1969 115			
<b>Synonyms/Trade Names:</b> 2-Methylpropane [Note: Also see specific listing for n-Butane.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 800 ppm (1900 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless gas with a gasoline-like or natural gas odor. [Note: Shipped as a liquefied compressed gas. A liquid below 11°F.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 58.1 <b>BP:</b> 11°F <b>Sol:</b> Slight <b>Fl.P:</b> NA (Gas) <b>IP:</b> 10.74 eV <b>RGasD:</b> 2.06 <b>VP(70°F):</b> 3.1 atm <b>FRZ:</b> -255°F <b>UEL:</b> 8.4% <b>LEL:</b> 1.6% Flammable Gas		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., nitrates & perchlorates), chlorine, fluorine, (nickel carbonyl + oxygen)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Drow, narco, asphy; liquid: frostbite <b>TO:</b> CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support		

<b>Isobutyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOCH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 110-19-0	<b>RTECS#:</b> A14025000	<b>IDLH:</b> 1300 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>		<b>DOT:</b> 1213 129			
<b>Synonyms/Trade Names:</b> Isobutyl ester of acetic acid, 2-Methylpropyl acetate, 2-Methylpropyl ester of acetic acid, β-Methylpropyl ethanoate					
<b>Exposure Limits:</b> NIOSH REL: TWA 150 ppm (700 mg/m <sup>3</sup> ) OSHA PEL: TWA 150 ppm (700 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1450 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a fruity, floral odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 243°F Sol(77°F): 0.6% Fl.P: 64°F IP: 9.97 eV Sp.Gr: 0.87 VP: 13 mmHg FRZ: -145°F UEL: 10.5% LEL: 1.3% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>1300 ppm:</b> Sa:CfE/CcrFOv/GmFOv/ PapOvE/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; head, drow, anes; in animals: narco TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Isobutyl alcohol</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> OH	<b>CAS#:</b> 78-83-1	<b>RTECS#:</b> NP9625000	<b>IDLH:</b> 1600 ppm
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1212 129			
<b>Synonyms/Trade Names:</b> IBA, Isobutanol, Isopropylcarbinol, 2-Methyl-1-propanol					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (150 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (300 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1401, 1405 OSHA 7	
<b>Physical Description:</b> Colorless, oily liquid with a sweet, musty odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 227°F Sol: 10% Fl.P: 82°F IP: 10.12 eV Sp.Gr: 0.80 VP: 9 mmHg FRZ: -162°F UEL(202°F): 10.6% LEL(123°F): 1.7% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>500 ppm:</b> CcrOv*/Sa* <b>1250 ppm:</b> Sa:Cf*/PapOv* <b>1600 ppm:</b> CcrFOv/GmFOv/PapTOv*/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, throat; head, drow; skin cracking; in animals: narco TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Isobutyronitrile</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHCN	<b>CAS#:</b> 78-82-0	<b>RTECS#:</b> TZ4900000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.83 mg/m <sup>3</sup>		<b>DOT:</b> 2284 131			
<b>Synonyms/Trade Names:</b> Isopropyl cyanide, 2-Methylpropanenitrile, 2-Methylpropionitrile					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 8 ppm (22 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> none				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1606</b> (adapt)	
<b>Physical Description:</b> Colorless liquid with an almond-like odor. <b>[Note:</b> Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 69.1 <b>BP:</b> 219°F <b>Sol:</b> Slight <b>Fl.P.:</b> 47°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.76 <b>VP(130°F):</b> 100 mmHg <b>FRZ:</b> -97°F <b>UEL:</b> ? <b>LEL:</b> ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>80 ppm:</b> CcrOv/Sa <b>200 ppm:</b> Sa:Cf/Pap/Ov <b>400 ppm:</b> CcrFOv/GmFOv/Pap/TOV/ScbaF/SaF <b>1000 ppm:</b> SaF:Pd,Pp <b>S:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; head, dizz, lass, conf, convuls; dysp; abdom pain, nau, vomit <b>TO:</b> Eyes, skin, resp sys, CNS, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isooctyl alcohol</b>		<b>Formula:</b> C <sub>7</sub> H <sub>15</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 26952-21-6	<b>RTECS#:</b> NS7700000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.33 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Isooctanol, Oxooctyl alcohol <b>[Note:</b> A mixture of closely related isomeric, primary alcohols with branched chains such as 2-Ethylhexanol, CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> CH(CH <sub>2</sub> CH <sub>3</sub> )CH <sub>2</sub> OH.]					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 50 ppm (270 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> <b>OSHA PV2033</b>	
<b>Physical Description:</b> Clear, colorless liquid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 130.3 <b>BP:</b> 367°F <b>Sol:</b> Insoluble <b>Fl.P(oc):</b> 180°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.83 <b>VP:</b> 0.4 mmHg <b>FRZ:</b> <-105°F <b>UEL(est.):</b> 5.7% <b>LEL(calc.):</b> 0.9% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; eye, skin burns <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isophorone</b>	<b>Formula:</b> C <sub>9</sub> H <sub>14</sub> O	<b>CAS#:</b> 78-59-1	<b>RTECS#:</b> GW7700000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 5.65 mg/m <sup>3</sup>		<b>DOT:</b> 1993 128 (combustible liquid, n.o.s.)		
<b>Synonyms/Trade Names:</b> Isoacetophorone; 3,5,5-Trimethyl-2-cyclohexenone; 3,5,5-Trimethyl-2-cyclo-hexen-1-one				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 4 ppm (23 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 25 ppm (140 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 2508, 2556 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless to white liquid with a peppermint-like odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 138.2 <b>BP:</b> 419°F <b>Sol:</b> 1% <b>Fl.P:</b> 184°F <b>IP:</b> 9.07 eV <b>Sp.Gr:</b> 0.92 <b>VP:</b> 0.3 mmHg <b>FRZ:</b> 17°F <b>UEL:</b> 3.8% <b>LEL:</b> 0.8% Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>40 ppm:</b> CcrOv*/Sa* <b>100 ppm:</b> Sa:Cf*/PaprOv* <b>200 ppm:</b> CcrFOv/GmFOv/PaprTOv*/ SaT:Cf*/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong alkalis, amines				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; head, nau, dizz, lass, mal, narco; derm; in animals: kidney, liver damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isophorone diisocyanate</b>	<b>Formula:</b> C <sub>12</sub> H <sub>18</sub> N <sub>2</sub> O <sub>2</sub>	<b>CAS#:</b> 4098-71-9	<b>RTECS#:</b> NQ9370000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 9.09 mg/m <sup>3</sup>		<b>DOT:</b> 2290 156		
<b>Synonyms/Trade Names:</b> IPDI; 3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl-isocyanate; Isophorone diamine diisocyanate				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.005 ppm (0.045 mg/m <sup>3</sup> ) [skin] ST 0.02 ppm (0.180 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5525 <b>OSHA</b> PV2034	
<b>Physical Description:</b> Colorless to slightly yellow liquid with a pungent odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 222.3 <b>BP:</b> ? <b>Sol:</b> Decomposes <b>Fl.P:</b> 311°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.06 <b>VP:</b> 0.0003 mmHg <b>FRZ:</b> -76°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>0.05 ppm:</b> Sa* <b>0.125 ppm:</b> Sa:Cf* <b>0.25 ppm:</b> ScbaF/SaF <b>1 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water, alcohols, phenols, amines, mercaptans, amides, urethanes, ureas <b>[Note:</b> Reacts with water to form carbon dioxide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; chest tight, dysp, cough, sore throat; bron, wheez, pulm edema; possible resp sens, asthma <b>TO:</b> Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>2-Isopropoxyethanol</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHOCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 109-59-1	<b>RTECS#:</b> KL5075000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Ethylene glycol isopropyl ether, β-Hydroxyethyl isopropyl ether, Isopropyl Cellosolve®, Isopropyl glycol					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a mild, ethereal odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 104.2 BP: 283°F Sol: Miscible F.L.P(oc): 92°F IP: ? Sp.Gr: 0.90 VP: 3 mmHg FRZ: ? UEL: ? LEL: ? Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: In animals: irrit eyes, skin; hema, anemia, pulm edema TO: Eyes, skin, resp sys, blood			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isopropyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOCH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 108-21-4	<b>RTECS#:</b> A14930000	<b>IDLH:</b> 1800 ppm
<b>Conversion:</b> 1 ppm = 4.18 mg/m <sup>3</sup>		<b>DOT:</b> 1220 129			
<b>Synonyms/Trade Names:</b> Isopropyl ester of acetic acid, 1-Methylethyl ester of acetic acid, 2-Propyl acetate					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 250 ppm (950 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1454, 1460 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 102.2 BP: 194°F Sol: 3% F.L.P: 36°F IP: 9.95 eV Sp.Gr: 0.87 VP: 42 mmHg FRZ: -92°F UEL: 8% LEL(100°F): 1.8% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>1800 ppm:</b> Sa:Cf£/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; dermat; in animals: narco TO: Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isopropyl alcohol</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHOH	<b>CAS#:</b> 67-63-0	<b>RTECS#:</b> NT8050000	<b>IDLH:</b> 2000 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 2.46 mg/m <sup>3</sup>	<b>DOT:</b> 1219 129			
<b>Synonyms/Trade Names:</b> Dimethyl carbinol, IPA, Isopropanol, 2-Propanol, sec-Propyl alcohol, Rubbing alcohol				
<b>Exposure Limits:</b> NIOSH REL: TWA 400 ppm (980 mg/m <sup>3</sup> ) ST 500 ppm (1225 mg/m <sup>3</sup> ) OSHA PEL†: TWA 400 ppm (980 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1400 OSHA 109	
<b>Physical Description:</b> Colorless liquid with the odor of rubbing alcohol.				
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 181°F Sol: Miscible Fl.P: 53°F IP: 10.10 eV Sp.Gr: 0.79 VP: 33 mmHg FRZ: -127°F UEL(200°F): 12.7% LEL: 2.0% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa:CfE/CcrFOv/GmFOv/ PapOvE/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acetaldehyde, chlorine, ethylene oxide, acids, isocyanates				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; drow, dizz, head; dry cracking skin; in animals: narco TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Isopropylamine</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHNH <sub>2</sub>	<b>CAS#:</b> 75-31-0	<b>RTECS#:</b> NT8400000	<b>IDLH:</b> 750 ppm
<b>Conversion:</b> 1 ppm = 2.42 mg/m <sup>3</sup>	<b>DOT:</b> 1221 132			
<b>Synonyms/Trade Names:</b> 2-Aminopropane, Monoisopropylamine, 2-Propylamine, sec-Propylamine				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 5 ppm (12 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S147 (II-3)	
<b>Physical Description:</b> Colorless liquid with an ammonia-like odor. [Note: A gas above 91°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 59.1 BP: 91°F Sol: Miscible Fl.P(oc): -35°F IP: 8.72 eV Sp.Gr: 0.69 VP: 460 mmHg FRZ: -150°F UEL: ? LEL: ? Class IA Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>125 ppm:</b> Sa:CfE/PapRSE <b>250 ppm:</b> CcrFS/GmFS/PapRTSE/ ScbaF/SaF <b>750 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids, strong oxidizers, aldehydes, ketones, epoxides				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; pulm edema; vis dist; eye, skin burns; derm TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>N-Isopropylaniline</b>		<b>Formula:</b> C <sub>8</sub> H <sub>9</sub> NHCH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 768-52-5	<b>RTECS#:</b> BY4190000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.53 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> N-IPA, Isopropylaniline, N-(1-Methylethyl)-benzenamine, N-Phenylisopropylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (10 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none				<b>Measurement Methods</b> (see Table 1): <b>OSHA 78</b>	
<b>Physical Description:</b> Clear, yellowish liquid with a sweet, aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 135.2 <b>BP:</b> 397°F <b>Sol:</b> ? <b>Fl.P(oc):</b> 190°F <b>IP:</b> ? <b>Sp.Gr(60°F):</b> 0.93 <b>VP(77°F):</b> 0.03 mmHg <b>FRZ:</b> -58°F <b>UEL:</b> ? <b>LEL:</b> ? Class III B Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; head, lass, dizz; cyan; ataxia; dysp on effort; tacar; methemo <b>TO:</b> Eyes, skin, resp sys, blood, CVS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isopropyl ether</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHOCH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 108-20-3	<b>RTECS#:</b> TZ5425000	<b>IDLH:</b> 1400 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.18 mg/m <sup>3</sup>		<b>DOT:</b> 1159 127			
<b>Synonyms/Trade Names:</b> Diisopropyl ether, Diisopropyl oxide, 2-Isopropoxy propane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 500 ppm (2100 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 500 ppm (2100 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): <b>NIOSH 1618</b> <b>OSHA 7</b>	
<b>Physical Description:</b> Colorless liquid with a sharp, sweet, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 102.2 <b>BP:</b> 154°F <b>Sol:</b> 0.2% <b>Fl.P:</b> -18°F <b>IP:</b> 9.20 eV <b>Sp.Gr:</b> 0.73 <b>VP:</b> 119 mmHg <b>FRZ:</b> -76°F <b>UEL:</b> 7.9% <b>LEL:</b> 1.4% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1400 ppm:</b> CcrOv*/PaprOv*/GmFOv/ Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids [Note: Unstable peroxides may form on long contact with air.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose; resp discomfort; dermat; in animals: drow, dizz, uncon, narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Isopropyl glycidyl ether</b>	<b>Formula:</b> C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	<b>CAS#:</b> 4016-14-2	<b>RTECS#:</b> TZ3500000	<b>IDLH:</b> 400 ppm
<b>Conversion:</b> 1 ppm = 4.75 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2-Epoxy-3-isopropoxypropane; IGE; Isopropoxymethyl oxirane				
<b>Exposure Limits:</b> NIOSH REL: C 50 ppm (240 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: TWA 50 ppm (240 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1620 OSHA 7	
<b>Physical Description:</b> Colorless liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 116.2 BP: 279°F Sol: 19% Fl.P: 92°F IP: ? Sp.Gr: 0.92 VP(77°F): 9 mmHg FRZ: ? UEL: ? LEL: ? Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>400 ppm:</b> Sa:Cf£/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong caustics [Note: May form explosive peroxides upon exposure to air or light.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; skin sens; possible hemato, repro effects TO: Eyes, skin, resp sys, blood, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

K

<b>Kaolin</b>	<b>Formula:</b>	<b>CAS#:</b> 1332-58-7	<b>RTECS#:</b> GF1670500	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> China clay, Clay, Hydrated aluminum silicate, Hydrite, Porcelain clay [Note: Main constituent of Kaolin is Kaolinite (Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub> .)]				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> White to yellowish or grayish powder. [Note: When moistened, darkens & develops a clay-like odor.]				
<b>Chemical &amp; Physical Properties:</b> MW: varies BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 1.8-2.6 VP: 0 mmHg (approx) MLT: ? UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Chronic pulm fib, stomach granuloma TO: Resp sys, stomach			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Kepone</b>		<b>Formula:</b> C <sub>10</sub> Cl <sub>10</sub> O	<b>CAS#:</b> 143-50-0	<b>RTECS#:</b> PC8575000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Chlordecone; Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta(cd)-pentalen-2-one; Decachlorooctahydro-kepone-2-one; Decachlorotetrahydro-4,7-methanoindeneone					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.001 mg/m <sup>3</sup> See Appendix A OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> NIOSH 5508	
<b>Physical Description:</b> Tan to white, crystalline, odorless solid. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 490.6 BP: Sublimes Sol(212°F): 0.5% Fl.P: NA IP: ? Sp.Gr: ? VP(77°F): 3 x 10 <sup>-7</sup> mmHg MLT: 662°F (Sublimes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScaF:Pd,Pp/SaF:Pd,Pp:AScBa Escape: GmFOv100/ScaBE	
<b>Incompatibilities and Reactivities:</b> Acids, acid fumes					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, anxi, tremor; liver, kidney damage; vis dist; ataxia, chest pain, skin eryt; testicular atrophy, low sperm count; [carc] TO: Eyes, skin, resp sys, CNS, liver, kidneys, repro sys [in animal: liver cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

K

<b>Kerosene</b>		<b>Formula:</b>	<b>CAS#:</b> 8008-20-6	<b>RTECS#:</b> OA5500000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1223 128			
<b>Synonyms/Trade Names:</b> Fuel Oil No. 1, Range oil [Note: A refined petroleum solvent (predominantly C <sub>9</sub> -C <sub>16</sub> ), which typically is 25% normal paraffins, 11% branched paraffins, 30% monocycloparaffins, 12% dicycloparaffins, 1% tricycloparaffins, 16% mononuclear aromatics, and 5% dinuclear aromatics.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 mg/m <sup>3</sup> OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> NIOSH 1550	
<b>Physical Description:</b> Colorless to yellowish, oily liquid with a strong, characteristic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 170 (approx) BP: 347-617°F Sol: Insoluble Fl.P: 100-162°F IP: ? Sp.Gr: 0.81 VP(100°F): 5 mmHg FRZ: -50°F UEL: 5% LEL: 0.7% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 1000 mg/m <sup>3</sup> : CcrOv/Sa 2500 mg/m <sup>3</sup> : Sa:Cf/PapRov 5000 mg/m <sup>3</sup> : CcrFOv/GmFOv/ PapRTOv/ScaF/SaF ☒: ScaF:Pd,Pp/SaF:Pd,Pp:AScBa Escape: GmFOv/ScaBE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; burning sensation in chest; head, nau, lass, restless, inco, conf, drow; vomit, diarr; dermat; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Ketene</b>	<b>Formula:</b> CH <sub>2</sub> =CO	<b>CAS#:</b> 463-51-4	<b>RTECS#:</b> OA7700000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 1.72 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Carbomethene, Ethenone, Keto-ethylene				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 ppm (0.9 mg/m <sup>3</sup> ) ST 1.5 ppm (3 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.5 ppm (0.9 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S92 (II-2)	
<b>Physical Description:</b> Colorless gas with a penetrating odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 42.0 BP: -69°F Sol: Reacts Fl.P: NA (Gas) IP: 9.61 eV RGasD: 1.45 VP: >1 atm FRZ: -238°F UEL: ? LEL: ? Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 5 ppm: Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Water, alcohols, ammonia [Note: Readily polymerizes. Reacts with water to form acetic acid.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, nose, throat, resp sys; pulm edema TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Lead</b>	<b>Formula:</b> Pb	<b>CAS#:</b> 7439-92-1	<b>RTECS#:</b> OF7525000	<b>IDLH:</b> 100 mg/m <sup>3</sup> (as Pb)
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Lead metal, Plumbum				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.050 mg/m <sup>3</sup> See Appendix C OSHA PEL*: [1910.1025] TWA 0.050 mg/m <sup>3</sup> See Appendix C [*Note: The REL and PEL also apply to other lead compounds (as Pb) -- see Appendix C.]			<b>Measurement Methods</b> (see Table 1): NIOSH 7082, 7105, 7300, 7301, 7303, 7700, 7701, 7702, 9102, 9105 OSHA ID121, ID125G, ID206	
<b>Physical Description:</b> A heavy, ductile, soft, gray solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 207.2 BP: 3164°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 11.34 VP: 0 mmHg (approx) MLT: 621°F UEL: NA LEL: NA Noncombustible Solid in bulk form.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 0.5 mg/m <sup>3</sup> : 100XQ/Sa 1.25 mg/m <sup>3</sup> : Sa:Cf/PapRHiE 2.5 mg/m <sup>3</sup> : 100F/SaT:Cf/PapRTHie/ ScbaF/SaF 50 mg/m <sup>3</sup> : Sa:Pd,Pp 100 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers, hydrogen peroxide, acids			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Lass, insom; facial pallor; anor, low-wgt, malnut; constip, abdom pain, colic; anemia; gingival lead line; tremor; para wrist, ankles; encephalopathy; kidney disease; irrit eyes; hypotension TO: Eyes, GI tract, CNS, kidneys, blood, gingival tissue			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush prompt Breath: Resp support Swallow: Medical attention immed	

<b>Limestone</b>	<b>Formula:</b> CaCO <sub>3</sub>	<b>CAS#:</b> 1317-65-3	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Calcium carbonate, Natural calcium carbonate [ <b>Note:</b> Calcite & aragonite are commercially important natural calcium carbonates.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Odorless, white to tan powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 100.1 BP: Decomposes Sol: 0.001% Fl.P: NA IP: NA Sp.Gr: 2.7-2.9 VP: 0 mmHg (approx) MLT: 1517-2442°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Fluorine, magnesium, acids, alum, ammonium salts				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, muc memb; cough, sneez, rhin; lac TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air	

<b>Lindane</b>	<b>Formula:</b> C <sub>6</sub> H <sub>6</sub> Cl <sub>6</sub>	<b>CAS#:</b> 58-89-9	<b>RTECS#:</b> GV4900000	<b>IDLH:</b> 50 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2761 151			
<b>Synonyms/Trade Names:</b> BHC; HCH; γ-Hexachlorocyclohexane; gamma isomer of 1,2,3,4,5,6-Hexachlorocyclohexane				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.5 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods (see Table 1):</b> NIOSH 5502	
<b>Physical Description:</b> White to yellow, crystalline powder with a slight, musty odor. [pesticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 290.8 BP: 614°F Sol: 0.001% Fl.P: NA IP: ? Sp.Gr: 1.85 VP: 0.00001 mmHg MLT: 235°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> 5 mg/m <sup>3</sup> : CcrOv95/Sa 12.5 mg/m <sup>3</sup> : Sa:C*/Pap/OvHie* 25 mg/m <sup>3</sup> : CcrFOv100/GmFOv100/ Pap/OvHie*/ScaB/SaF 50 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScaB:Pd,Pp/SaF:Pd,Pp,AScaB <b>Escape:</b> GmFOv100/ScaB	
<b>Incompatibilities and Reactivities:</b> Corrosive to metals				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; head; nau; clonic convuls; resp difficulty; cyan; aplastic anemia; musc spasm; in animals: liver, kidney damage TO: Eyes, skin, resp sys, CNS, blood, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Lithium hydride</b>	<b>Formula:</b> LiH	<b>CAS#:</b> 7580-67-8	<b>RTECS#:</b> OJ6300000	<b>IDLH:</b> 0.5 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1414 138; 2805 138 (fused, solid)			
<b>Synonyms/Trade Names:</b> Lithium monohydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.025 mg/m <sup>3</sup> OSHA PEL: TWA 0.025 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): OSHA ID121	
<b>Physical Description:</b> Odorless, off-white to gray, translucent, crystalline mass or white powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 7.95 BP: Decomposes Sol: Reacts Fl.P: NA IP: NA Sp.Gr: 0.78 VP: 0 mmHg (approx) MLT: 1256°F UEL: NA LEL: NA Combustible Solid that can form airborne dust clouds which may explode on contact with flame, heat, or oxidizers.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Brush (DO NOT WASH) <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench (>0.5 mg/m <sup>3</sup> )	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.25 mg/m<sup>3</sup>:</b> 100XQ/Sa <b>0.5 mg/m<sup>3</sup>:</b> Sa:Cf*/100F/Pap/Hie*/ ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, halogenated hydrocarbons, acids, water [Note: May ignite SPONTANEOUSLY in air and may reignite after fire is extinguished. Reacts with water to form hydrogen & lithium hydroxide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; eye, skin burns; mouth, esophagus burns (if ingested); nau; musc twitches; mental conf; blurred vision TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Brush (DO NOT WASH) <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>L.P.G.</b>	<b>Formula:</b> C <sub>3</sub> H <sub>8</sub> /C <sub>3</sub> H <sub>6</sub> /C <sub>4</sub> H <sub>10</sub> /C <sub>4</sub> H <sub>8</sub>	<b>CAS#:</b> 68476-85-7	<b>RTECS#:</b> SE7545000	<b>IDLH:</b> 2000 ppm [10%LEL]
<b>Conversion:</b>	<b>DOT:</b> 1075 115			
<b>Synonyms/Trade Names:</b> Bottled gas, Compressed petroleum gas, Liquefied hydrocarbon gas, Liquefied petroleum gas, LPG [Note: A fuel mixture of propane, propylene, butanes & butylenes.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (1800 mg/m <sup>3</sup> ) OSHA PEL: TWA 1000 ppm (1800 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S93 (II-2)	
<b>Physical Description:</b> Colorless, noncorrosive, odorless gas when pure. [Note: A foul-smelling odorant is usually added. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 42-58 BP: >44°F Sol: Insoluble Fl.P: NA (Gas) IP: 10.95 eV RGasD: 1.45-2.00 VP: >1 atm FRZ: ? UEL: 9.5% (Propane) 8.5% (Butane) LEL: 2.1% (Propane) 1.9% (Butane) Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chlorine dioxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Dizz, drow, asphy; liquid: frostbite TO: Resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (liquid) <b>Skin:</b> Water flush immed (liquid) <b>Breath:</b> Resp support		

<b>Magnesite</b>	<b>Formula:</b> MgCO <sub>3</sub>	<b>CAS#:</b> 546-93-0	<b>RTECS#:</b> OM2470000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Carbonate magnesium, Hydromagnesite, Magnesium carbonate, Magnesium(II) carbonate [ <b>Note:</b> Magnesite is a naturally-occurring form of magnesium carbonate.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> White, odorless, crystalline powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 84.3 BP: Decomposes Sol: 0.01% F.I.P: NA IP: NA Sp.Gr: 2.96 VP: 0 mmHg (approx) MLT: 662°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> Acids, formaldehyde				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; cough TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air	

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<b>Magnesium oxide fume</b>	<b>Formula:</b> MgO	<b>CAS#:</b> 1309-48-4	<b>RTECS#:</b> OM3850000	<b>IDLH:</b> 750 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Magnesia fume				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303 OSHA ID121	
<b>Physical Description:</b> Finely divided white particulate dispersed in air. [ <b>Note:</b> Exposure may occur when magnesium is burned, thermally cut, or welded upon.]				
<b>Chemical &amp; Physical Properties:</b> MW: 40.3 BP: 6512°F Sol(86°F): 0.009% F.I.P: NA IP: NA Sp.Gr: 3.58 VP: 0 mmHg (approx) MLT: 5072°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> OSHA 150 mg/m <sup>3</sup> : 95XQ/Sa 375 mg/m <sup>3</sup> : Sa:Cf/PaprHie 750 mg/m <sup>3</sup> : 100F/PaprTHie*/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Chlorine trifluoride, phosphorus pentachloride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose; metal fume fever: cough, chest pain, flu-like fever TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Malathion</b>	<b>Formula:</b> C <sub>10</sub> H <sub>19</sub> O <sub>6</sub> PS <sub>2</sub>	<b>CAS#:</b> 121-75-5	<b>RTECS#:</b> WM8400000	<b>IDLH:</b> 250 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> S-[1,2-bis(ethoxycarbonyl) ethyl]O,O-dimethyl-phosphorodithioate; Diethyl (dimethoxyphosphinothioylthio) succinate				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> [skin] <b>OSHA PEL†:</b> TWA 15 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5600 <b>OSHA</b> 62	
<b>Physical Description:</b> Deep-brown to yellow liquid with a garlic-like odor. [insecticide] [Note: A solid below 37°F.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 330.4 <b>BP:</b> 140°F (Decomposes) <b>Sol:</b> 0.02% <b>Fl.P(oc):</b> >325°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.21 <b>VP:</b> 0.00004 mmHg <b>FRZ:</b> 37°F <b>UEL:</b> ? <b>LEL:</b> ? Class III B Combustible Liquid, but may be difficult to ignite.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>100 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>250 mg/m<sup>3</sup>:</b> Sa:Cf*/CcrFOv100/ GmFOv100/PaprvHie*/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers, magnesium, alkaline pesticides [Note: Corrosive to metals.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; miosis, aching eyes, blurred vision, lac; salv; anor, nau, vomit, abdom cramps, diarr, dizz, conf, ataxia; rhin, head; chest tight, wheez, lar spasm <b>TO:</b> Eyes, skin, resp sys, liver, blood chol, CNS, CVS, GI tract			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Maleic anhydride</b>	<b>Formula:</b> C <sub>4</sub> H <sub>2</sub> O <sub>3</sub>	<b>CAS#:</b> 108-31-6	<b>RTECS#:</b> ON3675000	<b>IDLH:</b> 10 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 4.01 mg/m <sup>3</sup>	<b>DOT:</b> 2215 156			
<b>Synonyms/Trade Names:</b> cis-Butenedioic anhydride; 2,5-Furanedione; Maleic acid anhydride; Toxicic anhydride				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 mg/m <sup>3</sup> (0.25 ppm) <b>OSHA PEL:</b> TWA 1 mg/m <sup>3</sup> (0.25 ppm)			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 3512 <b>OSHA</b> 25, 86	
<b>Physical Description:</b> Colorless needles, white lumps, or pellets with an irritating, choking odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 98.1 <b>BP:</b> 396°F <b>Sol:</b> Reacts <b>Fl.P:</b> 218°F <b>IP:</b> 9.90 eV <b>Sp.Gr:</b> 1.48 <b>VP:</b> 0.2 mmHg <b>MLT:</b> 127°F <b>UEL:</b> 7.1% <b>LEL:</b> 1.4% Combustible Solid, but may be difficult to ignite.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10 mg/m<sup>3</sup>:</b> Sa:Cfē/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers, water, alkalis, metals, caustics, and amines above 150°F [Note: Reacts slowly with water (hydrolyzes) to form maleic acid.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit nose, upper resp sys; conj; photo, double vision; bronchial asthma; derm <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Malonaldehyde</b>		<b>Formula:</b> CHOCH <sub>2</sub> CHO	<b>CAS#:</b> 542-78-9	<b>RTECS#:</b> TX6475000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Malonic aldehyde; Malonodialdehyde; Propanedial; 1,3-Propanedial [Note: Pure Malonaldehyde is unstable and may be used as its sodium salt.]					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A See Appendix C (Aldehydes) OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Solid (needles).					
<b>Chemical &amp; Physical Properties:</b> MW: 72.1 BP: ? Sol: ? Fl.P: ? IP: ? Sp.Gr: ? VP: ? MLT: 161°F UEL: ? LEL: ?		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Proteins [Note: Pure compound is stable under neutral conditions, but not under acidic conditions.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; CNS depres; [carc] TO: Eyes, skin, resp sys, CNS [in animals: thyroid gland tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Malononitrile</b>		<b>Formula:</b> NCCH <sub>2</sub> CN	<b>CAS#:</b> 109-77-3	<b>RTECS#:</b> OO3150000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.70 mg/m <sup>3</sup>		<b>DOT:</b> 2647 153			
<b>Synonyms/Trade Names:</b> Cyanoacetoneitrile, Dicyanomethane, Malonic dinitrile					
<b>Exposure Limits:</b> NIOSH REL: TWA 3 ppm (8 mg/m <sup>3</sup> ) OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> NIOSH Nitriles Criteria Document	
<b>Physical Description:</b> White powder or colorless crystals. [Note: Melts above 90°F. Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> MW: 66.1 BP: 426°F Sol: 13% Fl.P(oc): 266°F IP: 12.88 eV Sp.Gr: 1.19 VP: ? MLT: 90°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 80 mg/m <sup>3</sup> : Sa 200 mg/m <sup>3</sup> : Sa:Cf 400 mg/m <sup>3</sup> : ScbaF/SaF 667 mg/m <sup>3</sup> : SaF:Pd,Pp ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong bases [Note: May polymerize violently on prolonged heating at 265°F, or in contact with strong bases at lower temperatures.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; head, dizz, lass, conf, convuls; dysp; abdom pain, nau, vomit TO: Eyes, skin, resp sys, CNS, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Manganese compounds and fume (as Mn)</b>	<b>Formula:</b> Mn (metal)	<b>CAS#:</b> 7439-96-5 (metal)	<b>RTECS#:</b> OO9275000 (metal)	<b>IDLH:</b> 500 mg/m <sup>3</sup> (as Mn)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Manganese metal: Colloidal manganese, Manganese-55 Synonyms of other compounds vary depending upon the specific manganese compound.				
<b>Exposure Limits:</b> NIOSH REL*: TWA 1 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> [*Note: Also see specific listings for Manganese cyclopentadienyl tricarbonyl, Methyl cyclopentadienyl manganese tricarbonyl, and Manganese tetroxide.] OSHA PEL*: C 5 mg/m <sup>3</sup> [*Note: Also see specific listings for Manganese cyclopentadienyl tricarbonyl and Methyl cyclopentadienyl manganese tricarbonyl.]			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
<b>Physical Description:</b> A lustrous, brittle, silvery solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 54.9 BP: 3564°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 7.20 (metal) VP: 0 mmHg (approx) MLT: 2271°F UEL: NA LEL: NA Metal: Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 10 mg/m <sup>3</sup> : 95XQ/Sa 25 mg/m <sup>3</sup> : Sa:Cf/PapRHi 50 mg/m <sup>3</sup> : 100F/SaT:Cf/PapRTHie/ ScbaF/SaF 500 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
		<b>Incompatibilities and Reactivities:</b> Oxidizers [Note: Will react with water or steam to produce hydrogen.]		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing SY: Parkinson's; asthenia, insom, mental conf; metal fume fever: dry throat, cough, chest tight, dysp, rales, flu-like fever; low-back pain; vomit; mal; lass; kidney damage TO: Resp sys, CNS, blood, kidneys			<b>First Aid (see Table 6):</b> Breath: Resp support Swallow: Medical attention immed	

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<b>Manganese cyclopentadienyl tricarbonyl (as Mn)</b>	<b>Formula:</b> C <sub>5</sub> H <sub>5</sub> Mn(CO) <sub>3</sub>	<b>CAS#:</b> 12079-65-1	<b>RTECS#:</b> OO9720000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cyclopentadienylmanganese tricarbonyl, Cyclopentadienyl tricarbonyl manganese, MCT				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> [skin] OSHA PEL†: C 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Yellow, crystalline solid with a characteristic odor. [Note: An antiknock additive for gasoline. May be found in an oil & gaseous solution.]				
<b>Chemical &amp; Physical Properties:</b> MW: 204.1 BP: Sublimes Sol: Slight Fl.P: ? IP: ? Sp.Gr: ? VP: ? MLT: 167°F (Sublimes) UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
		<b>Incompatibilities and Reactivities:</b> Oxygen		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: In animals: irrit skin; pulm edema; convuls; CNS, resp sys, kidney changes; decr resistance to infection TO: Skin, resp sys, CNS, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

<b>Manganese tetroxide (as Mn)</b>	<b>Formula:</b> Mn <sub>2</sub> O <sub>4</sub>	<b>CAS#:</b> 1317-35-7	<b>RTECS#:</b> OP0895000	<b>IDLH:</b> N.D.	
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Manganese oxide, Manganomanganic oxide, Trimanganese tetroxide, Trimanganese tetroxide					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: C 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G		
<b>Physical Description:</b> Brownish-black powder. [Note: Fumes are generated whenever manganese oxides are heated strongly in air.]					
<b>Chemical &amp; Physical Properties:</b> MW: 228.8 BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 4.88 VP: 0 mmHg (approx) MLT: 2847°F UEL: NA LEL: NA		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Soluble in hydrochloric acid (liberates chlorine gas)					
M	<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Asthenia, insom, mental conf; low-back pain; vomit; mal, lass; kidney damage; pneu TO: Resp sys, CNS, blood, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

<b>Marble</b>	<b>Formula:</b> CaCO <sub>3</sub>	<b>CAS#:</b> 1317-65-3	<b>RTECS#:</b> EV9580000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Calcium carbonate, Natural calcium carbonate [Note: Marble is a metamorphic form of calcium carbonate.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Odorless, white powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 100.1 BP: Decomposes Sol: 0.001% Fl.P: NA IP: NA Sp.Gr: 2.7-2.9 VP: 0 mmHg (approx) MLT: 1517-2442°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> Fluorine, magnesium, acids, alum, ammonium salts				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, muc memb, upper resp sys; cough, sneez, rhin; lac TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air	

<b>Mercury compounds [except (organo) alkyls] (as Hg)</b>	<b>Formula:</b> Hg (metal)	<b>CAS#:</b> 7439-97-6 (metal)	<b>RTECS#:</b> OV4550000 (metal)	<b>IDLH:</b> 10 mg/m <sup>3</sup> (as Hg)
<b>Conversion:</b>	<b>DOT:</b> 2809 172 (metal)			
<b>Synonyms/Trade Names:</b> Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver Synonyms of "other" Hg compounds vary depending upon the specific compound.				
<b>Exposure Limits:</b> NIOSH REL: Hg Vapor: TWA 0.05 mg/m <sup>3</sup> [skin] Other: C 0.1 mg/m <sup>3</sup> [skin]		<b>OSHA PEL†:</b> C 0.1 mg/m <sup>3</sup>		<b>Measurement Methods (see Table 1):</b> NIOSH 6009 OSHA ID140
<b>Physical Description:</b> Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]				
<b>Chemical &amp; Physical Properties:</b> MW: 200.6 BP: 674°F Sol: Insoluble Fl.P: NA IP: ? Sp.Gr: 13.6 (metal) VP: 0.0012 mmHg FRZ: -38°F UEL: NA LEL: NA Metal: Noncombustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>Mercury vapor:</b> NIOSH <b>0.5 mg/m<sup>3</sup>:</b> CcrS†/Sa <b>1.25 mg/m<sup>3</sup>:</b> Sa:Cf/PapRSt†(canister) <b>2.5 mg/m<sup>3</sup>:</b> CcrFS†/GmFS†/SaT:Cf/PapRTS(canister)/ScbaF/SaF <b>10 mg/m<sup>3</sup>:</b> Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE  <b>Other mercury compounds:</b> NIOSH/OSHA <b>1 mg/m<sup>3</sup>:</b> CcrS†/Sa <b>2.5 mg/m<sup>3</sup>:</b> Sa:Cf/PapRSt†(canister) <b>5 mg/m<sup>3</sup>:</b> CcrFS†/GmFS†/SaT:Cf/PapRTS(canister)/ScbaF/SaF <b>10 mg/m<sup>3</sup>:</b> Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; cough, chest pain, dysp, bron, pneu; tremor, insom, irrity, indecision, head, lass; stomatitis, saliv; GI dist, anor, low-wgt; prot TO: Eyes, skin, resp sys, CNS, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Mercury (organo) alkyl compounds (as Hg)</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 2 mg/m <sup>3</sup> (as Hg)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific (organo) alkyl mercury compound.				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.01 mg/m <sup>3</sup> ST 0.03 mg/m <sup>3</sup> [skin]		<b>OSHA PEL†:</b> TWA 0.01 mg/m <sup>3</sup> C 0.04 mg/m <sup>3</sup>		<b>Measurement Methods (see Table 1):</b> None available
<b>Physical Description:</b> Appearance and odor vary depending upon the specific (organo) alkyl mercury compound.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific (organo) alkyl mercury compound.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA <b>0.1 mg/m<sup>3</sup>:</b> Sa <b>0.25 mg/m<sup>3</sup>:</b> Sa:Cf <b>0.5 mg/m<sup>3</sup>:</b> SaT:Cf/ScbaF/SaF <b>2 mg/m<sup>3</sup>:</b> Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers such as chlorine				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Pares; ataxia, dysarthria; vision, hearing dist; spasticity, jerking limbs; dizz; saliv; lac; nau, vomit, diarr, constip; skin burns; emotional dist; kidney inj; possible terato effects TO: Eyes, skin, CNS, PNS, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Mesityl oxide</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> C=CHCOCH <sub>3</sub>	<b>CAS#:</b> 141-79-7	<b>RTECS#:</b> SB4200000	<b>IDLH:</b> 1400 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.02 mg/m <sup>3</sup>		<b>DOT:</b> 1229 129			
<b>Synonyms/Trade Names:</b> Isobutenyl methyl ketone, Isopropylideneacetone, Methyl isobutenyl ketone, 4-Methyl-3-penten-2-one					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (40 mg/m <sup>3</sup> ) OSHA PEL†: TWA 25 ppm (100 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1301, 2553 OSHA 7	
<b>Physical Description:</b> Oily, colorless to light-yellow liquid with a peppermint- or honey-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 98.2 BP: 266°F Sol: 3% Fl.P: 87°F IP: 9.08 eV Sp.Gr(59°F): 0.86 VP: 9 mmHg FRZ: -52°F UEL: 7.2% LEL: 1.4% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>250 ppm:</b> Sa:Cf/ PaprOv/£ <b>500 ppm:</b> CcrFOv/GmFOv/PaprTOv/£ ScbaF/SaF <b>1400 ppm:</b> SaF:Pd,Pp £: ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; narco, coma; in animals: liver, kidney damage; CNS effects TO: Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Methacrylic acid</b>		<b>Formula:</b> CH <sub>2</sub> =C(CH <sub>3</sub> )COOH	<b>CAS#:</b> 79-41-4	<b>RTECS#:</b> OZ2975000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.52 mg/m <sup>3</sup>		<b>DOT:</b> 2531 153P (inhibited)			
<b>Synonyms/Trade Names:</b> Methacrylic acid (glacial), Methacrylic acid (inhibited), α-Methacrylic acid, 2-Methylacrylic acid, 2-Methylpropenoic acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 20 ppm (70 mg/m <sup>3</sup> ) [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA PV2005	
<b>Physical Description:</b> Colorless liquid or solid (below 61°F) with an acrid, repulsive odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 86.1 BP: 325°F Sol(77°F): 9% Fl.P(oc): 171°F IP: ? Sp.Gr: 1.02 (Liquid) VP: 0.7 mmHg FRZ: 61°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, elevated temperatures, hydrochloric acid [Note: Typically contains 100 ppm of the monomethyl ether of hydroquinone to prevent polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; eye, skin burns TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Methomyl</b>	<b>Formula:</b> CH <sub>3</sub> C(SCH <sub>3</sub> )NOC(O)NHCH <sub>3</sub>	<b>CAS#:</b> 16752-77-5	<b>RTECS#:</b> AK2975000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2757 151 (carbamate pesticide, solid, toxic)			
<b>Synonyms/Trade Names:</b> Lannate®, Methyl N-((methylamino)carbonyloxy)ethanimidothioate, S-Methyl-N-(methylcarbamoyloxy)thioacetimidate				
<b>Exposure Limits:</b> NIOSH REL: TWA 2.5 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5601	
<b>Physical Description:</b> White, crystalline solid with a slight, sulfur-like odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 162.2 BP: ? Sol(77°F): 6% Fl.P: NA IP: ? Sp.Gr(75°F): 1.29 VP(77°F): 0.00005 mmHg MLT: 172°F UEL: NA LEL: NA Noncombustible Solid, but may be dissolved in flammable liquids.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong bases				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; blurred vision, miosis; saliv; abdom cramps, nau, vomit; dysp; lass, musc twitch; liver, kidney damage TO: Eyes, resp sys, CNS, CVS, liver, kidneys, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Methoxychlor</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>4</sub> OCH <sub>3</sub> ) <sub>2</sub> CHCCl <sub>3</sub>	<b>CAS#:</b> 72-43-5	<b>RTECS#:</b> KJ3675000	<b>IDLH:</b> Ca [5000 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 2761 151 (organochlorine pesticide, solid, toxic)			
<b>Synonyms/Trade Names:</b> p,p'-Dimethoxydiphenyltrichloroethane; DMDT; Methoxy-DDT; 2,2-bis(p-Methoxyphenyl)-1,1,1-trichloroethane; 1,1,1-Trichloro-2,2-bis-(p-methoxyphenyl)ethane				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: TWA 15 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH S371 (II-4) OSHA PV2038	
<b>Physical Description:</b> Colorless to light-yellow crystals with a slight, fruity odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 345.7 BP: Decomposes Sol: 0.00001% Fl.P: ? IP: ? Sp.Gr: 1.41 VP: Very low MLT: 171°F UEL: ? LEL: ? Combustible Solid, but difficult to burn.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFov100/ScbaE
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing SY: In animals: fasc, trembling, convuls; kidney, liver damage; [carc] TO: CNS, liver, kidneys [in animals: liver & ovarian cancer]			<b>First Aid (see Table 6):</b> <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed	

<b>Methoxyflurane</b>		<b>Formula:</b> CHCl <sub>2</sub> CF <sub>2</sub> OCH <sub>3</sub>	<b>CAS#:</b> 76-38-0	<b>RTECS#:</b> KN7820000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.75 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2,2-Dichloro-1,1-difluoroethyl methyl ether; 2,2-Dichloro-1,1-difluoro-1-methoxyethane; Methoflurane; Methoxyflurane; Penthrane					
<b>Exposure Limits:</b> NIOSH REL*: C 2 ppm (13.5 mg/m <sup>3</sup> ) [60-minute] [*Note: REL for exposure to waste anesthetic gas.] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a fruity odor. [inhalation anesthetic]					
<b>Chemical &amp; Physical Properties:</b> MW: 165.0 BP: 220°F Sol: Slight Fl.P.: ? IP: ? Sp.Gr(77°F): 1.42 VP: 23 mmHg FRZ: -31°F UEL: ? LEL(176°F): 7% Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; CNS depres, analgesia, anes, convuls, resp depres; liver, kidney inj; in animals: repro, terato effects TO: Eyes, CNS, liver, kidneys, repro sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

M

<b>4-Methoxyphenol</b>		<b>Formula:</b> CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub> OH	<b>CAS#:</b> 150-76-5	<b>RTECS#:</b> SL7700000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Hydroquinone monomethyl ether, p-Hydroxyanisole, Mequinol, p-Methoxyphenol, Monomethyl ether hydroquinone					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to white, waxy solid with an odor of caramel & phenol.					
<b>Chemical &amp; Physical Properties:</b> MW: 124.2 BP: 469°F Sol(77°F): 4% Fl.P(oc): 270°F IP: 7.50 eV Sp.Gr: 1.55 VP: <0.01 mmHg MLT: 135°F UEL: ? LEL: ? Combustible Solid; under certain conditions, a dust cloud can probably explode if ignited by a spark or flame.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong bases, acid chlorides, acid anhydrides					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat, upper resp sys; eye, skin burns; CNS depres TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Methyl acetate</b>	<b>Formula:</b> CH <sub>3</sub> COOCH <sub>3</sub>	<b>CAS#:</b> 79-20-9	<b>RTECS#:</b> AI9100000	<b>IDLH:</b> 3100 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1231 129		
<b>Synonyms/Trade Names:</b> Methyl ester of acetic acid, Methyl ethanoate				
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (610 mg/m <sup>3</sup> ) ST 250 ppm (760 mg/m <sup>3</sup> ) OSHA PEL†: TWA 200 ppm (610 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1458 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a fragrant, fruity odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 135°F Sol: 25% Fl.P: 14°F IP: 10.27 eV Sp.Gr: 0.93 VP: 173 mmHg FRZ: -145°F UEL: 16% LEL: 3.1% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> CcrOv*/Sa* <b>3100 ppm:</b> Sa:Cf*/CcrFOv/GmFOv/ PapOv*/ScbaF/SaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids; water [Note: Reacts slowly with water to form acetic acid & methanol.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; head, drow; optic nerve atrophy; chest tight; in animals: narco TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

M

<b>Methyl acetylene</b>	<b>Formula:</b> CH <sub>3</sub> C≡CH	<b>CAS#:</b> 74-99-7	<b>RTECS#:</b> UK4250000	<b>IDLH:</b> 1700 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 1.64 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Allylene, Propine, Propyne, 1-Propyne				
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (1650 mg/m <sup>3</sup> ) OSHA PEL: TWA 1000 ppm (1650 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S84 (II-5)	
<b>Physical Description:</b> Colorless gas with a sweet odor. [Note: A fuel that is shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 40.1 BP: -10°F Sol: Insoluble Fl.P: NA (Gas) IP: 10.36 eV RGasD: 1.41 VP: 5.2 atm FRZ: -153°F UEL: ? LEL: 1.7% Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1700 ppm:</b> Sa/ScbaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as chlorine), copper alloys [Note: Can decompose explosively at 4.5 to 5.6 atmospheres of pressure.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Irrit resp sys; tremor, hyperexcitability, anes; liquid: frostbite TO: Resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support		

<b>Methyl acetylene-propadiene mixture</b>	<b>Formula:</b> CH <sub>3</sub> ≡CH/CH <sub>2</sub> =C=CH <sub>2</sub>	<b>CAS#:</b> 59355-75-8	<b>RTECS#:</b> UK4920000	<b>IDLH:</b> 3400 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 1.64 mg/m <sup>3</sup>	<b>DOT:</b> 1060 116P (stabilized)			
<b>Synonyms/Trade Names:</b> MAPP gas, Methyl acetylene-allene mixture, Propadiene-methyl acetylene, Methyl acetylene-propadiene mixture (stabilized), Propyne-allene mixture, Propyne-propadiene mixture				
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (1800 mg/m <sup>3</sup> ) ST 1250 ppm (2250 mg/m <sup>3</sup> ) OSHA PEL†: TWA 1000 ppm (1800 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH S85 (II-6) OSHA 7	
<b>Physical Description:</b> Colorless gas with a strong, characteristic, foul odor. [Note: A fuel that is shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 40.1 BP: -36 to -4°F Sol: Insoluble FI.P: NA (Gas) IP: ? RGasD: 1.48 VP: >1 atm FRZ: -213°F UEL: 10.8% LEL: 3.4% Flammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>3400 ppm:</b> Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, copper alloys [Note: Forms explosive compounds at high pressure in contact with alloys containing more than 67% copper.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Irrit resp sys; excitement, conf, anes; liquid: frostbite TO: Resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Methyl acrylate</b>	<b>Formula:</b> CH <sub>2</sub> =CHCOOCH <sub>3</sub>	<b>CAS#:</b> 96-33-3	<b>RTECS#:</b> AT2800000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 3.52 mg/m <sup>3</sup>	<b>DOT:</b> 1919 129P (inhibited)			
<b>Synonyms/Trade Names:</b> Methoxycarbonylethylene, Methyl ester of acrylic acid, Methyl propenoate				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (35 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 10 ppm (35 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> NIOSH 1459, 2552 OSHA 92	
<b>Physical Description:</b> Colorless liquid with an acid odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 86.1 BP: 176°F Sol: 6% FI.P: 27°F IP: 9.90 eV Sp.Gr: 0.96 VP: 65 mmHg FRZ: -106°F UEL: 25% LEL: 2.8% Class IB Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>100 ppm:</b> Sa* <b>250 ppm:</b> Sa:Cf/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Nitrates, oxidizers such as peroxides, strong alkalis [Note: Polymerizes easily; usually contains an inhibitor such as hydroquinone.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methylacrylonitrile</b>	<b>Formula:</b> CH <sub>2</sub> =C(CH <sub>3</sub> )CN	<b>CAS#:</b> 126-98-7	<b>RTECS#:</b> UD1400000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.74 mg/m <sup>3</sup>	<b>DOT:</b> 3079 131P (inhibited)			
<b>Synonyms/Trade Names:</b> 2-Cyanopropene-1, 2-Cyano-1-propene, Isoprene cyanide, Isopropenyl nitrile, Methacrylonitrile, $\alpha$ -Methylacrylonitrile, 2-Methylpropenenitrile				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 ppm (3 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid with an odor like bitter almonds.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 67.1 <b>BP:</b> 195°F <b>Sol:</b> 3% <b>Fl.P:</b> 34°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.80 <b>VP(77°F):</b> 71 mmHg <b>FRZ:</b> -32°F <b>UEL:</b> 6.8% <b>LEL:</b> 2% Class IB Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strong acids, strong oxidizers, alkali, light [Note: Polymerization may occur due to elevated temperature, visible light, or contact with a concentrated alkali.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; lac; in animals: convuls, loss of motor control in hind limbs <b>TO:</b> Eyes, skin, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

M

<b>Methylal</b>	<b>Formula:</b> CH <sub>3</sub> OCH <sub>2</sub> OCH <sub>3</sub>	<b>CAS#:</b> 109-87-5	<b>RTECS#:</b> PA8750000	<b>IDLH:</b> 2200 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.11 mg/m <sup>3</sup>	<b>DOT:</b> 1234 127			
<b>Synonyms/Trade Names:</b> Dimethoxymethane, Formal, Formaldehyde dimethylacetal, Methoxymethyl methyl ether, Methylene dimethyl ether				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1000 ppm (3100 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 1000 ppm (3100 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1611</b>	
<b>Physical Description:</b> Colorless liquid with a chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 76.1 <b>BP:</b> 111°F <b>Sol:</b> 33% <b>Fl.P(oc):</b> -26°F <b>IP:</b> 10.00 eV <b>Sp.Gr:</b> 0.86 <b>VP:</b> 330 mmHg <b>FRZ:</b> -157°F <b>UEL:</b> 13.8% <b>LEL:</b> 2.2% Class IB Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2200 ppm:</b> Sa/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; anes <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methyl alcohol</b>		<b>Formula:</b> CH <sub>3</sub> OH	<b>CAS#:</b> 67-56-1	<b>RTECS#:</b> PC1400000	<b>IDLH:</b> 6000 ppm
<b>Conversion:</b> 1 ppm = 1.31 mg/m <sup>3</sup>		<b>DOT:</b> 1230 131			
<b>Synonyms/Trade Names:</b> Carbinol, Columbian spirits, Methanol, Pyroligneous spirit, Wood alcohol, Wood naphtha, Wood spirit					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 200 ppm (260 mg/m <sup>3</sup> ) ST 250 ppm (325 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> TWA 200 ppm (260 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 2000, 3800 <b>OSHA</b> 91	
<b>Physical Description:</b> Colorless liquid with a characteristic pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 32.1 BP: 147°F Sol: Miscible Fl.P: 52°F IP: 10.84 eV Sp.Gr: 0.79 VP: 96 mmHg FRZ: -144°F UEL: 36% LEL: 6.0% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa <b>5000 ppm:</b> Sa: Cf <b>6000 ppm:</b> Sa:T: Cf/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; head, drow, dizz, nau, vomit; vis dist, optic nerve damage (blindness); derm <b>TO:</b> Eyes, skin, resp sys, CNS, GI tract			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

M

<b>Methylamine</b>		<b>Formula:</b> CH <sub>3</sub> NH <sub>2</sub>	<b>CAS#:</b> 74-89-5	<b>RTECS#:</b> PF6300000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 1.27 mg/m <sup>3</sup>		<b>DOT:</b> 1061 118 (anhydrous); 1235 132 (aqueous)			
<b>Synonyms/Trade Names:</b> Aminomethane, Methylamine (anhydrous), Methylamine (aqueous), Monomethylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 ppm (12 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 10 ppm (12 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>OSHA</b> 40	
<b>Physical Description:</b> Colorless gas with a fish- or ammonia-like odor. [Note: A liquid below 21°F. Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 31.1 BP: 21°F Sol: Soluble Fl.P: NA (Gas) 14°F (Liquid) IP: 8.97 eV RGasD: 1.08 Sp.Gr: 0.70 (Liquid at 13°F) VP: 3.0 atm FRZ: -136°F UEL: 20.7% LEL: 4.9% Flammable Gas		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact (solution) Frostbite <b>Eyes:</b> Prevent eye contact (solution) Frostbite <b>Wash skin:</b> When contam (solution) <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>100 ppm:</b> CcrFS/GmFS/PapRSE/ ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Mercury, strong oxidizers, nitromethane [Note: Corrosive to copper & zinc alloys, aluminum & galvanized surfaces.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs (solution), Ing (solution), Con (solution/liquid) <b>SY:</b> Irrit eyes, skin, resp sys; cough; skin, muc memb burns; derm; conj; liquid: frostbite <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (solution)/Frostbite <b>Skin:</b> Water flush immed (solution)/Frostbite <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (solution)		

<b>Methyl (n-amyl) ketone</b>	<b>Formula:</b> CH <sub>3</sub> CO[CH <sub>2</sub> ] <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 110-43-0	<b>RTECS#:</b> MJ5075000	<b>IDLH:</b> 800 ppm
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>	<b>DOT:</b> 1110 127			
<b>Synonyms/Trade Names:</b> Amyl methyl ketone, n-Amyl methyl ketone, 2-Heptanone				
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (465 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (465 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 1301, 2553	
<b>Physical Description:</b> Colorless to white liquid with a banana-like, fruity odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 114.2 BP: 305°F Sol: 0.4% Fl.P: 102°F IP: 9.33 eV Sp.Gr: 0.81 VP: 3 mmHg FRZ: -32°F UEL(250°F): 7.9% LEL(151°F): 1.1% Class II Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 800 ppm: CcrOv*/PapRov*/GmFOv/ Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong acids, alkalis & oxidizers [Note: Will attack some forms of plastic.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; head; narco, coma; derm TO: Eyes, skin, resp sys, CNS, PNS		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air Swallow: Medical attention immed		

M

<b>Methyl bromide</b>	<b>Formula:</b> CH <sub>3</sub> Br	<b>CAS#:</b> 74-83-9	<b>RTECS#:</b> PA4900000	<b>IDLH:</b> Ca [250 ppm]
<b>Conversion:</b> 1 ppm = 3.89 mg/m <sup>3</sup>	<b>DOT:</b> 1062 123			
<b>Synonyms/Trade Names:</b> Bromomethane, Monobromomethane				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: C 20 ppm (80 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> NIOSH 2520 OSHA PV2040	
<b>Physical Description:</b> Colorless gas with a chloroform-like odor at high concentrations. [Note: A liquid below 38°F. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 95.0 BP: 38°F Sol: 2% Fl.P: NA (Gas) IP: 10.54 eV RGasD: 3.36 Sp.Gr: 1.73 (Liquid at 32°F) VP: 1.9 atm FRZ: -137°F UEL: 16.0% LEL: 10% Flammable Gas, but only in presence of a high energy ignition source.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact (liquid) Eyes: Prevent eye contact (liquid) Wash skin: When contam (liquid) Remove: When wet (flamm) Change: N.R. Provide: Quick drench (liquid)	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Aluminum, magnesium, strong oxidizers [Note: Attacks aluminum to form aluminum trimethyl, which is SPONTANEOUSLY flammable.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs (liquid), Con (liquid) SY: Irrit eyes, skin, resp sys; musc weak, inco, vis dist, dizz; nau, vomit, head; mal; hand tremor; convuls; dysp; skin vesic; liquid: frostbite; [carc] TO: Eyes, skin, resp sys, CNS [in animals: lung, kidney & forestomach tumors]			<b>First Aid (see Table 6):</b> Eye: Irr immed (liquid) Skin: Water flush immed (liquid) Breath: Resp support	

<b>Methyl Cellosolve®</b>		<b>Formula:</b> CH <sub>2</sub> OCH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 109-86-4	<b>RTECS#:</b> KL5775000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 3.11 mg/m <sup>3</sup>		<b>DOT:</b> 1188 127			
<b>Synonyms/Trade Names:</b> EGME, Ethylene glycol monomethyl ether, Glycol monomethyl ether, 2-Methoxyethanol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.3 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL:</b> TWA 25 ppm (80 mg/m <sup>3</sup> ) [skin]					<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1403 <b>OSHA</b> 53, 79
<b>Physical Description:</b> Colorless liquid with a mild, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 76.1 <b>BP:</b> 256°F <b>Sol:</b> Miscible <b>F.I.P:</b> 102°F <b>IP:</b> 9.60 eV <b>Sp.Gr:</b> 0.96 <b>VP:</b> 6 mmHg <b>FRZ:</b> -121°F <b>UEL:</b> 14% <b>LEL:</b> 1.8% Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>1 ppm:</b> Sa* <b>2.5 ppm:</b> Sa:Cf* <b>5 ppm:</b> ScbaF/SaF <b>100 ppm:</b> Sa:Pd,Pp* <b>200 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, caustics					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; head, drow, lass; ataxia, tremor; anemic pallor; in animals: repro, terato effects <b>TO:</b> Eyes, resp sys, CNS, blood, kidneys, repro sys, hemato sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

M

<b>Methyl Cellosolve® acetate</b>		<b>Formula:</b> CH <sub>2</sub> COOCH <sub>2</sub> CH <sub>2</sub> OCH <sub>3</sub>	<b>CAS#:</b> 110-49-6	<b>RTECS#:</b> KL5950000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 4.83 mg/m <sup>3</sup>		<b>DOT:</b> 1189 129			
<b>Synonyms/Trade Names:</b> EGMEA, Ethylene glycol monomethyl ether acetate, Glycol monomethyl ether acetate, 2-Methoxyethyl acetate					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.5 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL:</b> TWA 25 ppm (120 mg/m <sup>3</sup> ) [skin]					<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1451 <b>OSHA</b> 53, 79
<b>Physical Description:</b> Colorless liquid with a mild, ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 118.1 <b>BP:</b> 293°F <b>Sol:</b> Miscible <b>F.I.P:</b> 120°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.01 <b>VP:</b> 2 mmHg <b>FRZ:</b> -85°F <b>UEL:</b> 8.2% <b>LEL:</b> 1.7% Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>1 ppm:</b> Sa* <b>2.5 ppm:</b> Sa:Cf* <b>5 ppm:</b> ScbaF/SaF <b>100 ppm:</b> Sa:Pd,Pp* <b>200 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; kidney, brain damage; in animals: narco; repro, terato effects <b>TO:</b> Eyes, resp sys, kidneys, brain, CNS, PNS, repro sys, hemato sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Methyl chloride</b>		<b>Formula:</b> CH <sub>3</sub> Cl	<b>CAS#:</b> 74-87-3	<b>RTECS#:</b> PA6300000	<b>IDLH:</b> Ca [2000 ppm]
<b>Conversion:</b> 1 ppm = 2.07 mg/m <sup>3</sup>		<b>DOT:</b> 1063 115			
<b>Synonyms/Trade Names:</b> Chloromethane, Monochloromethane					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3 hours)				<b>Measurement Methods</b> (see Table 1): NIOSH 1001	
<b>Physical Description:</b> Colorless gas with a faint, sweet odor which is not noticeable at dangerous concentrations. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 50.5 BP: -12°F Sol: 0.5% F.I.P: NA (Gas) IP: 11.28 eV RGasD: 1.78 VP: 5.0 atm FRZ: -144°F UEL: 17.4% LEL: 8.1% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as potassium, powdered aluminum, zinc, and magnesium; water [Note: Reacts with water (hydrolyzes) to form hydrochloric acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Dizz, nau, vomit; vis dist, stagger, slurred speech, convuls, coma; liver, kidney damage; liquid: frostbite; repro, terato effects; [carc] TO: CNS, liver, kidneys, repro sys [in animals: lung, kidney & forestomach tumors]				<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

M

<b>Methyl chloroform</b>		<b>Formula:</b> CH <sub>3</sub> CCl <sub>3</sub>	<b>CAS#:</b> 71-55-6	<b>RTECS#:</b> KJ2975000	<b>IDLH:</b> 700 ppm
<b>Conversion:</b> 1 ppm = 5.46 mg/m <sup>3</sup>		<b>DOT:</b> 2831 160			
<b>Synonyms/Trade Names:</b> Chloroethene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)					
<b>Exposure Limits:</b> NIOSH REL: C 350 ppm (1900 mg/m <sup>3</sup> ) [15-minute] See Appendix C (Chloroethanes) OSHA PEL†: TWA 350 ppm (1900 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1003	
<b>Physical Description:</b> Colorless liquid with a mild, chloroform-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 133.4 BP: 165°F Sol: 0.4% F.I.P: ? IP: 11.00 eV Sp.Gr: 1.34 VP: 100 mmHg FRZ: -23°F UEL: 12.5% LEL: 7.5% Combustible Liquid, but burns with difficulty.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 700 ppm: Sa*/ScbaF ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; head, lass, CNS depres, poor equi; derm; card arrhy; liver damage TO: Eyes, skin, CNS, CVS, liver				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Methyl-2-cyanoacrylate</b>		<b>Formula:</b> CH <sub>2</sub> =C(CN)COOCH <sub>3</sub>	<b>CAS#:</b> 137-05-3	<b>RTECS#:</b> AS7000000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.54 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Mecrylate, Methyl cyanoacrylate, Methyl α-cyanoacrylate, Methyl ester of 2-cyanoacrylic acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (8 mg/m <sup>3</sup> ) ST 4 ppm (16 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> OSHA 55	
<b>Physical Description:</b> Colorless liquid with a characteristic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 111.1 BP: ? Sol: 30% Fl.P: 174°F IP: ? Sp.Gr(81°F): 1.10 VP(77°F): 0.2 mmHg FRZ: ? UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: N.R. Change: N.R. Provide: Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Moisture [Note: Contact with moisture causes rapid polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; blurred vision, lac; rhinitis TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash Breath: Resp support Swallow: Medical attention immed		

M

<b>Methylcyclohexane</b>		<b>Formula:</b> CH <sub>2</sub> C <sub>6</sub> H <sub>11</sub>	<b>CAS#:</b> 108-87-2	<b>RTECS#:</b> GV6125000	<b>IDLH:</b> 1200 ppm [LEL]
<b>Conversion:</b> 1 ppm = 4.02 mg/m <sup>3</sup>		<b>DOT:</b> 2296 128			
<b>Synonyms/Trade Names:</b> Cyclohexylmethane, Hexahydrotoluene					
<b>Exposure Limits:</b> NIOSH REL: TWA 400 ppm (1600 mg/m <sup>3</sup> ) OSHA PEL†: TWA 500 ppm (2000 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1500 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a faint, benzene-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 98.2 BP: 214°F Sol: Insoluble Fl.P: 25°F IP: 9.85 eV Sp.Gr: 0.77 VP: 37 mmHg FRZ: -196°F UEL: 6.7% LEL: 1.2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 1200 ppm: Sa/ScbaF §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, drow; in animals: narco TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Methylcyclohexanol</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>10</sub> OH	<b>CAS#:</b> 25639-42-3	<b>RTECS#:</b> GW0175000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>		<b>DOT:</b> 2617 129		
<b>Synonyms/Trade Names:</b> Hexahydrodrescol, Hexahydromethylphenol				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (235 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (470 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1404	
<b>Physical Description:</b> Straw-colored liquid with a weak odor like coconut oil.				
<b>Chemical &amp; Physical Properties:</b> MW: 114.2 BP: 311-356°F Sol: 4% Fl.P: 149-158°F IP: 9.80 eV Sp.Gr: 0.92 VP(86°F): 2 mmHg FRZ: -58°F UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>500 ppm:</b> Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys; head; in animals: narco; liver, kidney damage TO: Eyes, skin, resp sys, CNS, kidneys, liver		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

M

<b>o-Methylcyclohexanone</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>10</sub> O	<b>CAS#:</b> 583-60-8	<b>RTECS#:</b> GW1750000	<b>IDLH:</b> 600 ppm
<b>Conversion:</b> 1 ppm = 4.59 mg/m <sup>3</sup>		<b>DOT:</b> 2297 128		
<b>Synonyms/Trade Names:</b> 2-Methylcyclohexanone				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (230 mg/m <sup>3</sup> ) [skin] ST 75 ppm (345 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (460 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2521	
<b>Physical Description:</b> Colorless liquid with a weak, peppermint-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 112.2 BP: 325°F Sol: Insoluble Fl.P: 118°F IP: ? Sp.Gr: 0.93 VP: 1 mmHg FRZ: 7°F UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>500 ppm:</b> Sa* <b>600 ppm:</b> Sa: Cf*/ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: In animals: irrit eyes, muc memb; narco; derm TO: Skin, resp sys, liver, kidneys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Methyl cyclopentadienyl manganese tricarbonyl (as Mn)</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>5</sub> H <sub>4</sub> Mn(CO) <sub>3</sub>	<b>CAS#:</b> 12108-13-3	<b>RTECS#:</b> OP1450000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Cl-2, Combustion Improver-2, Manganese tricarbonylmethylcyclopentadienyl, 2-Methylcyclopentadienyl manganese tricarbonyl, MMT				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 mg/m <sup>3</sup> [skin] OSHA PEL†: C 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Yellow to dark-orange liquid with a faint, pleasant odor. [Note: A solid below 36°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 218.1 BP: 449°F Sol: Insoluble F.P: 230°F IP: ? Sp.Gr: 1.39 VP(212°F): 7 mmHg FRZ: 36°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.		
<b>Incompatibilities and Reactivities:</b> Light (decomposes)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes; dizz, nau, head; in animals: tremor, severe clonic spasms, lass, slow respiration; liver, kidney inj TO: Eyes, CNS, liver, kidneys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

M

<b>Methyl demeton</b>	<b>Formula:</b> C <sub>6</sub> H <sub>15</sub> O <sub>3</sub> PS <sub>2</sub>	<b>CAS#:</b> 8022-00-2	<b>RTECS#:</b> TG1760000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Demeton methyl; O,O-Dimethyl 2-ethylmercaptoethyl thiophosphate; Metasystox®, Methyl mercaptophos; Methyl systox®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Oily, colorless to pale-yellow liquid with an unpleasant odor. [insecticide] [Note: Technical grade consists of 2 isomers: thiono & thio.]				
<b>Chemical &amp; Physical Properties:</b> MW: 230.3 BP: Decomposes Sol: 0.03-0.3% F.P: ? IP: ? Sp.Gr: 1.20 VP: 0.0004 mmHg FRZ: ? UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis, water				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; ache eyes, rhin; nau, head, dizz, vomit TO: Eyes, skin, resp sys, CNS, CVS, blood chol		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>4,4'-Methylenebis(2-chloroaniline)</b>		<b>Formula:</b> CH <sub>2</sub> (C <sub>6</sub> H <sub>4</sub> ClNH <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 101-14-4	<b>RTECS#:</b> CY1050000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> DACPM; 3,3'-Dichloro-4,4'-diaminodiphenylmethane; MBOCA; 4,4'-Methylenebis(o-chloro aniline); 4,4'-Methylenebis(2-chlorobenzeneamine); MOCA					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.003 mg/m <sup>3</sup> [skin] See Appendix A OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA 24, 71	
<b>Physical Description:</b> Tan-colored pellets or flakes with a faint, amine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 267.2 BP: ? Sol: Slight Fl.P: ? IP: ? Sp.Gr: 1.44 VP(77°F): 0.00001 mmHg MLT: 230°F UEL: ? LEL: ?		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☞: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals (e.g., potassium, sodium, magnesium, zinc)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Hema, cyan, nau, methemo, kidney irrit; [carc] TO: Liver, blood, kidneys [in animals: liver, lung & bladder tumors]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

M

<b>Methylene bis(4-cyclohexylisocyanate)</b>		<b>Formula:</b> CH <sub>2</sub> [(C <sub>6</sub> H <sub>10</sub> )NCO] <sub>2</sub>	<b>CAS#:</b> 5124-30-1	<b>RTECS#:</b> NQ9250000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 10.73 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dicyclohexylmethane 4,4'-diisocyanate; DMDI; bis(4-Isocyanatocyclohexyl)methane; HMDI; Hydrogenated MDI; Reduced MDI; Saturated MDI					
<b>Exposure Limits:</b> NIOSH REL: C 0.01 ppm (0.11 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 5525 OSHA PV2092	
<b>Physical Description:</b> Clear, colorless to light-yellow liquid.					
<b>Chemical &amp; Physical Properties:</b> MW: 262.4 BP: ? Sol: Reacts Fl.P: >395°F IP: ? Sp.Gr(77°F): 1.07 VP(77°F): 0.001 mmHg FRZ: <14°F UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>0.1 ppm:</b> Sa* <b>0.25 ppm:</b> Sa:CF* <b>0.5 ppm:</b> ScbaF/SaF <b>1 ppm:</b> SaF:Pd,Pp <b>☞:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Water, ethanol, alcohols, amines, bases, acids, organotin catalysts [Note: May slowly polymerize if heated above 122°F.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; skin, resp sens; chest tight, dysp, cough, dry throat, wheez, pulm edema; skin blisters TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methylene bisphenyl isocyanate</b>		<b>Formula:</b> CH <sub>2</sub> (C <sub>6</sub> H <sub>4</sub> NCO) <sub>2</sub>	<b>CAS#:</b> 101-68-8	<b>RTECS#:</b> NQ9350000	<b>IDLH:</b> 75 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 10.24 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4,4'-Diphenylmethane diisocyanate; MDI; Methylene bis(4-phenyl isocyanate); Methylene di-p-phenylene ester of isocyanic acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 mg/m <sup>3</sup> (0.005 ppm) C 0.2 mg/m <sup>3</sup> (0.020 ppm) [10-minute] OSHA PEL: C 0.2 mg/m <sup>3</sup> (0.02 ppm)				<b>Measurement Methods (see Table 1):</b> NIOSH 5521, 5522, 5525 OSHA 18	
<b>Physical Description:</b> White to light-yellow, odorless flakes. [Note: A liquid above 99°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 250.3 BP: 597°F Sol: 0.2% Fl.P: 390°F IP: ? Sp.Gr: 1.23 (Solid at 77°F) 1.19 (Liquid at 122°F) VP(77°F): 0.000005 mmHg MLT: 99°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 0.5 mg/m <sup>3</sup> : Sa* 1.25 mg/m <sup>3</sup> : Sa:Cf* 2.5 mg/m <sup>3</sup> : ScbaF/SaF 75 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong alkalis, acids, alcohol [Note: Polymerizes at 450°F.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; resp sens; cough, pulm secretions, chest pain, dysp; asthma TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Methylene chloride</b>		<b>Formula:</b> CH <sub>2</sub> Cl <sub>2</sub>	<b>CAS#:</b> 75-09-2	<b>RTECS#:</b> PA8050000	<b>IDLH:</b> Ca [2300 ppm]
<b>Conversion:</b> 1 ppm = 3.47 mg/m <sup>3</sup>		<b>DOT:</b> 1593 160			
<b>Synonyms/Trade Names:</b> Dichloromethane, Methylene dichloride					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1052] TWA 25 ppm ST 125 ppm				<b>Measurement Methods (see Table 1):</b> NIOSH 1005, 3800 OSHA 59, 80	
<b>Physical Description:</b> Colorless liquid with a chloroform-like odor. [Note: A gas above 104°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 84.9 BP: 104°F Sol: 2% Fl.P: ? IP: 11.32 eV Sp.Gr: 1.33 VP: 350 mmHg FRZ: -139°F UEL: 23% LEL: 13% Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH *: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers; caustics; chemically-active metals such as aluminum, magnesium powders, potassium & sodium; concentrated nitric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; lass, drow, dizz; numb, tingle limbs; nau; [carc] TO: Eyes, skin, CVS, CNS [in animals: lung, liver, salivary & mammary gland tumors]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>4,4'-Methylenedianiline</b>	<b>Formula:</b> CH <sub>2</sub> (C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 101-77-9	<b>RTECS#:</b> BY5425000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4,4'-Diaminodiphenylmethane; para, para'-Diaminodiphenyl-methane; Dianilinomethane; 4,4'-Diphenylmethanediamine; MDA				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1050] TWA 0.010 ppm ST 0.100 ppm			<b>Measurement Methods</b> (see Table 1): NIOSH 5029	
<b>Physical Description:</b> Pale-brown, crystalline solid with a faint, amine-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 198.3 BP: 748°F Sol: 0.1% Fl.P: 374°F IP: 10.70 eV Sp.Gr: 1.06 (Liquid at 212°F) VP(77°F): 0.0000002 mmHg MLT: 198°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☞: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOV100/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes; jaun, hepatitis; myocardial damage; in animals: heart, liver, spleen damage; [carc] TO: Eyes, liver, CVS, spleen [in animals: bladder cancer]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

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<b>Methyl ethyl ketone peroxide</b>	<b>Formula:</b> C <sub>8</sub> H <sub>16</sub> O <sub>4</sub>	<b>CAS#:</b> 1338-23-4	<b>RTECS#:</b> EL9450000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.21 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-Butanone peroxide, Ethyl methyl ketone peroxide, MEKP, MEK peroxide, Methyl ethyl ketone hydroperoxide				
<b>Exposure Limits:</b> NIOSH REL: C 0.2 ppm (1.5 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 3508 OSHA 77	
<b>Physical Description:</b> Colorless liquid with a characteristic odor. [Note: Explosive decomposition occurs at 230°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 176.2 BP: 244°F (Decomposes) Sol: Soluble Fl.P(oc): 125-200°F (60% MEKP) IP: ? Sp.Gr(59°F): 1.12 VP: ? FRZ: ? UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Organic materials, heat, flames, sunlight, trace contaminants [Note: A strong oxidizing agent. Pure MEKP is shock sensitive. Commercial product is diluted with 40% dimethyl phthalate, cyclohexane peroxide, or diallyl phthalate to reduce sensitivity to shock.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; cough, dysp, pulm edema; blurred vision; blisters, scars skin; abdom pain, vomit, diarr; derm; in animals: liver, kidney damage TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Methyl formate</b>	<b>Formula:</b> HCOOCH <sub>3</sub>	<b>CAS#:</b> 107-31-3	<b>RTECS#:</b> LQ8925000	<b>IDLH:</b> 4500 ppm
<b>Conversion:</b> 1 ppm = 2.46 mg/m <sup>3</sup>	<b>DOT:</b> 1243 129			
<b>Synonyms/Trade Names:</b> Methyl ester of formic acid, Methyl methanoate				
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (250 mg/m <sup>3</sup> ) ST 150 ppm (375 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (250 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S291 (II-5) OSHA PV2041	
<b>Physical Description:</b> Colorless liquid with a pleasant odor. [Note: A gas above 89°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 89°F Sol: 30% F.L.P.: -2°F IP: 10.82 eV Sp.Gr: 0.98 VP: 476 mmHg FRZ: -148°F UEL: 23% LEL: 4.5% Class IA Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> Sa* <b>2500 ppm:</b> Sa: Cf* <b>4500 ppm:</b> ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Reacts slowly with water to form methanol & formic acid.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose; chest tight, dysp; vis dist; CNS depres; in animals: pulm edema; narco <b>TO:</b> Eyes, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>5-Methyl-3-heptanone</b>	<b>Formula:</b> C <sub>2</sub> H <sub>5</sub> COCH <sub>2</sub> CH(CH <sub>3</sub> )CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 541-85-5	<b>RTECS#:</b> MJ7350000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 5.24 mg/m <sup>3</sup>	<b>DOT:</b> 2271 127			
<b>Synonyms/Trade Names:</b> Amyl ethyl ketone, Ethyl amyl ketone, 3-Methyl-5-heptanone				
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (130 mg/m <sup>3</sup> ) OSHA PEL: TWA 25 ppm (130 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1301, 2553	
<b>Physical Description:</b> Colorless liquid with a pungent odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 128.2 BP: 315°F Sol: Insoluble F.L.P.: 138°F IP: ? Sp.Gr: 0.82 VP: 2 mmHg FRZ: -70°F UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>100 ppm:</b> CcrOv*/Paprv*/GmFOv/ Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; head; narco, coma; derm <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methyl hydrazine</b>	<b>Formula:</b> CH <sub>3</sub> NHNH <sub>2</sub>	<b>CAS#:</b> 60-34-4	<b>RTECS#:</b> MV5600000	<b>IDLH:</b> Ca [20 ppm]
<b>Conversion:</b> 1 ppm = 1.89 mg/m <sup>3</sup>		<b>DOT:</b> 1244 131		
<b>Synonyms/Trade Names:</b> MMH, Monomethylhydrazine				
<b>Exposure Limits:</b> NIOSH REL: Ca C 0.04 ppm (0.08 mg/m <sup>3</sup> ) [2-hr] See Appendix A OSHA PEL: C 0.2 ppm (0.35 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 3510	
<b>Physical Description:</b> Fuming, colorless liquid with an ammonia-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 46.1 BP: 190°F Sol: Miscible Fl.P: 17°F IP: 8.00 eV Sp.Gr(77°F): 0.87 VP: 38 mmHg FRZ: -62°F UEL: 92% LEL: 2.5% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> ScbaE
<b>Incompatibilities and Reactivities:</b> Oxides of iron; copper; manganese; lead; copper alloys; porous materials such as earth, asbestos, wood & cloth; strong oxidizers such as fluorine & chlorine; nitric acid; hydrogen peroxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; vomit, diarr, tremor, ataxia; anoxia, cyan; convuls; [carc] TO: Eyes, skin, resp sys, CNS, liver, blood, CVS [in animals: lung, liver, blood vessel & intestine tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Methyl iodide</b>	<b>Formula:</b> CH <sub>3</sub> I	<b>CAS#:</b> 74-88-4	<b>RTECS#:</b> PA9450000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 5.80 mg/m <sup>3</sup>		<b>DOT:</b> 2644 151		
<b>Synonyms/Trade Names:</b> Iodomethane, Monoiodomethane				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 2 ppm (10 mg/m <sup>3</sup> ) [skin] See Appendix A OSHA PEL: TWA 5 ppm (28 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 1014	
<b>Physical Description:</b> Colorless liquid with a pungent, ether-like odor. [Note: Turns yellow, red, or brown on exposure to light & moisture.]				
<b>Chemical &amp; Physical Properties:</b> MW: 141.9 BP: 109°F Sol: 1% Fl.P: NA IP: 9.54 eV Sp.Gr: 2.28 VP: 400 mmHg FRZ: -88°F UEL: NA LEL: NA Noncombustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Decomposes at 518°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; nau, vomit; dizz, ataxia; slurred speech, drow; derm; [carc] TO: Eyes, skin, resp sys, CNS [in animals: lung, kidney & forestomach tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methyl isoamyl ketone</b>		<b>Formula:</b> CH <sub>3</sub> COCH <sub>2</sub> CH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 110-12-3	<b>RTECS#:</b> MP3850000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>		<b>DOT:</b> 2302 127			
<b>Synonyms/Trade Names:</b> Isoamyl methyl ketone, Isopentyl methyl ketone, 2-Methyl-5-hexanone, 5-Methyl-2-hexanone, MIAK					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 50 ppm (240 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 100 ppm (475 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>OSHA</b> PV2042	
<b>Physical Description:</b> Colorless, clear liquid with a pleasant, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 114.2 <b>BP:</b> 291°F <b>Sol:</b> 0.5% <b>Fl.P:</b> 97°F <b>IP:</b> 9.284 eV <b>Sp.Gr:</b> 0.81 <b>VP:</b> 5 mmHg <b>FRZ:</b> -101°F <b>UEL(200°F):</b> 8.2% <b>LEL(200°F):</b> 1.0% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>500 ppm:</b> CcrOv*/Sa* <b>1250 ppm:</b> Sa:Cf*/Paprov* <b>2500 ppm:</b> CcrFOv/GmFOv/PaprtOV*/ SaT:Cf*/ScbaF/SaF <b>5000 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; head, narco, coma; dermat; in animals: liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

M

<b>Methyl isobutyl carbinol</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> CH(OH)CH <sub>3</sub>	<b>CAS#:</b> 108-11-2	<b>RTECS#:</b> SA7350000	<b>IDLH:</b> 400 ppm
<b>Conversion:</b> 1 ppm = 4.18 mg/m <sup>3</sup>		<b>DOT:</b> 2053 129			
<b>Synonyms/Trade Names:</b> Isobutylmethylcarbinol, Methyl amyl alcohol, 4-Methyl-2-pentanol, MIBC					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 25 ppm (100 mg/m <sup>3</sup> ) ST 40 ppm (165 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> TWA 25 ppm (100 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1402, 1405 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a mild odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 102.2 <b>BP:</b> 271°F <b>Sol:</b> 2% <b>Fl.P:</b> 106°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.81 <b>VP:</b> 3 mmHg <b>FRZ:</b> -130°F <b>UEL:</b> 5.5% <b>LEL:</b> 1.0% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>250 ppm:</b> Sa* <b>400 ppm:</b> Sa:Cf*/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; head, drow; dermat; in animals: narco <b>TO:</b> Eyes, skin, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Methyl isocyanate</b>		<b>Formula:</b> CH <sub>3</sub> NCO	<b>CAS#:</b> 624-83-9	<b>RTECS#:</b> NQ9450000	<b>IDLH:</b> 3 ppm
<b>Conversion:</b> 1 ppm = 2.34 mg/m <sup>3</sup>		<b>DOT:</b> 2480 155			
<b>Synonyms/Trade Names:</b> Methyl ester of isocyanic acid, MIC					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.02 ppm (0.05 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 0.02 ppm (0.05 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): OSHA 54	
<b>Physical Description:</b> Colorless liquid with a sharp, pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 57.1 BP: 102-104°F Sol(59°F): 10% F.L.P: 19°F IP: 10.67 eV Sp.Gr: 0.96 VP: 348 mmHg FRZ: -49°F UEL: 26% LEL: 5.3% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.2 ppm:</b> Sa* <b>0.5 ppm:</b> Sa:Cf* <b>1 ppm:</b> ScaF/SaF <b>3 ppm:</b> SaF:Pd,Pp <b>§:</b> ScaF:Pd,Pp/SaF:Pd,Pp:ASca <b>Escape:</b> GmFOv/ScaE	
<b>Incompatibilities and Reactivities:</b> Water, oxidizers, acids, alkalis, amines, iron, tin, copper [Note: Usually contains inhibitors to prevent polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; resp sens, cough, pulm secretions, chest pain, dysp; asthma; eye, skin damage; in animals: pulm edema TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Methyl isopropyl ketone</b>		<b>Formula:</b> CH <sub>3</sub> COCH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 563-80-4	<b>RTECS#:</b> EL9100000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.53 mg/m <sup>3</sup>		<b>DOT:</b> 2397 127			
<b>Synonyms/Trade Names:</b> 2-Acetyl propane, Isopropyl methyl ketone, 3-Methyl-2-butanone, 3-Methyl butan-2-one, MIPK					
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (705 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with an acetone-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 86.2 BP: 199°F Sol: Very slight F.L.P: ? IP: 9.32 eV Sp.Gr: 0.81 VP: 42 mmHg FRZ: -134°F UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb, resp sys; cough TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methyl mercaptan</b>		<b>Formula:</b> CH <sub>3</sub> SH	<b>CAS#:</b> 74-93-1	<b>RTECS#:</b> PB4375000	<b>IDLH:</b> 150 ppm
<b>Conversion:</b> 1 ppm = 1.97 mg/m <sup>3</sup>		<b>DOT:</b> 1064 117			
<b>Synonyms/Trade Names:</b> Mercaptomethane, Methanethiol, Methyl sulphydrate					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (1 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: C 10 ppm (20 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2542 OSHA 26	
<b>Physical Description:</b> Colorless gas with a disagreeable odor like garlic or rotten cabbage. [Note: A liquid below 43°F. Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 48.1 BP: 43°F Sol: 2% FI.P: NA (Gas) (oc) 0°F (Liquid) IP: 9.44 eV RGasD: 1.66 Sp.Gr: 0.90 (Liquid at 32°F) VP: 1.7 atm FRZ: -186°F UEL: 21.8% LEL: 3.9% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) Frostbite <b>Eyes:</b> Prevent eye contact (liquid) Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid) Quick drench (liquid) Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>25 ppm:</b> CcrFov/GmFov/PaprtOv/ SaT:Cf/ScbaF/SaF <b>150 ppm:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, bleaches, copper, aluminum, nickel-copper alloys					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Irrit eyes, skin, resp sys; narco; cyan; convuls; liquid: frostbite <b>TO:</b> Eyes, skin, resp sys, CNS, blood				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed (liquid)/Frostbite <b>Skin:</b> Water flush immed (liquid)/Frostbite <b>Breath:</b> Resp support	

<b>Methyl methacrylate</b>		<b>Formula:</b> CH <sub>2</sub> =C(CH <sub>3</sub> )COOCH <sub>3</sub>	<b>CAS#:</b> 80-62-6	<b>RTECS#:</b> OZ5075000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 4.09 mg/m <sup>3</sup>		<b>DOT:</b> 1247 129P (inhibited)			
<b>Synonyms/Trade Names:</b> Methacrylate monomer, Methyl ester of methacrylic acid, Methyl-2-methyl-2-propenoate					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (410 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (410 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2537 OSHA 94	
<b>Physical Description:</b> Colorless liquid with an acrid, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 100.1 BP: 214°F Sol: 1.5% FI.P(oc): 50°F IP: 9.70 eV Sp.Gr: 0.94 VP: 29 mmHg FRZ: -54°F UEL: 8.2% LEL: 1.7% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> Sa:Cf£/CcrFov/GmFov/ Paprv£/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates, oxidizers, peroxides, strong alkalis, moisture [Note: May polymerize if subjected to heat, oxidizers, or ultraviolet light. Usually contains an inhibitor such as hydroquinone.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; derm <b>TO:</b> Eyes, skin, resp sys				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Methyl parathion</b>	<b>Formula:</b> (CH <sub>3</sub> O) <sub>2</sub> P(S)OC <sub>6</sub> H <sub>4</sub> NO <sub>2</sub>	<b>CAS#:</b> 298-00-0	<b>RTECS#:</b> TG0175000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2783 152 (solid); 3018 152 (liquid)			
<b>Synonyms/Trade Names:</b> Azophos®; O,O-Dimethyl-O-p-nitrophenylphosphorothioate; Parathion methyl				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 mg/m <sup>3</sup> [skin] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5600 OSHA PV2112	
<b>Physical Description:</b> White to tan, crystalline solid or powder with a pungent, garlic-like odor. [pesticide] [Note: The commercial product in xylene is a tan liquid.]				
<b>Chemical &amp; Physical Properties:</b> MW: 263.2 BP: 289°F Sol(77°F): 0.006% Fl.P: ? IP: ? Sp.Gr: 1.36 VP: 0.00001 mmHg MLT: 99°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>2 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>5 mg/m<sup>3</sup>:</b> Sa:Cf/Pap/OvHie <b>10 mg/m<sup>3</sup>:</b> CcrFOV100/GmFOV100/ PaprTOvHie/SaT:Cf/ ScbaF/SaF <b>200 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, water [Note: Explosive risk when heated above 122°F.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dypsp TO: Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Methyl silicate</b>	<b>Formula:</b> (CH <sub>3</sub> O) <sub>2</sub> Si	<b>CAS#:</b> 681-84-5	<b>RTECS#:</b> VV9800000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.23 mg/m <sup>3</sup>	<b>DOT:</b> 2606 155			
<b>Synonyms/Trade Names:</b> Methyl orthosilicate, Tetramethoxysilane, Tetramethyl ester of silicic acid, Tetramethyl silicate				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (6 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Clear, colorless liquid. [Note: A solid below 28°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 152.3 BP: 250°F Sol: Soluble Fl.P: 205°F IP: ? Sp.Gr: 1.02 VP(77°F): 12 mmHg FRZ: 28°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> Oxidizers; hexafluorides of rhenium, molybdenum & tungsten				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, corn damage (following even short-term exposure to the vapor); lung, kidney inj; pulm edema TO: Eyes, resp sys, kidneys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>α-Methyl styrene</b>		<b>Formula:</b> C <sub>8</sub> H <sub>8</sub> C(CH <sub>3</sub> )=CH <sub>2</sub>	<b>CAS#:</b> 98-83-9	<b>RTECS#:</b> WL5075300	<b>IDLH:</b> 700 ppm	
<b>Conversion:</b> 1 ppm = 4.83 mg/m <sup>3</sup>		<b>DOT:</b>				
<b>Synonyms/Trade Names:</b> AMS, Isopropenyl benzene, 1-Methyl-1-phenylethylene, 2-Phenyl propylene						
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 50 ppm (240 mg/m <sup>3</sup> ) ST 100 ppm (485 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> C 100 ppm (480 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1501</b> <b>OSHA 7</b>		
<b>Physical Description:</b> Colorless liquid with a characteristic odor.						
<b>Chemical &amp; Physical Properties:</b> MW: 118.2 BP: 330°F Sol: Insoluble Fl.P: 129°F IP: 8.35 eV Sp.Gr: 0.91 VP: 2 mmHg FRZ: -10°F UEL: 6.1% LEL: 1.9% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>500 ppm:</b> CcrOv*/Sa* <b>700 ppm:</b> Sa:Cf*/CcrFOv/GmFOv/ PapOv*/ScbaF/SaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, peroxides, halogens, catalysts for vinyl or ionic polymers; aluminum, iron chloride, copper [Note: Usually contains an inhibitor such as tert-butyl catechol.]						
<b>M</b>	<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; drow; derm TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Metribuzin</b>		<b>Formula:</b> C <sub>8</sub> H <sub>14</sub> N <sub>4</sub> OS	<b>CAS#:</b> 21087-64-9	<b>RTECS#:</b> XZ2990000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> <b>OSHA PV2044</b>	
<b>Physical Description:</b> Colorless, crystalline solid. [herbicide]					
<b>Chemical &amp; Physical Properties:</b> MW: 214.3 BP: ? Sol: 0.1% Fl.P: NA IP: ? Sp.Gr: 1.31 VP: 0.0000004 mmHg MLT: 257°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: CNS depress; thyroid, liver enzyme changes TO: CNS, thyroid, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Mica (containing less than 1% quartz)</b>	<b>Formula:</b>	<b>CAS#:</b> 12001-26-2	<b>RTECS#:</b> VV8760000	<b>IDLH:</b> 1500 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Biotite, Lepidolite, Margarite, Muscovite, Phlogopite, Roscoelite, Zimwaldite				
<b>Exposure Limits:</b> NIOSH REL: TWA 3 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 20 mppcf			<b>Measurement Methods</b> (see Table 1): NIOSH 0600	
<b>Physical Description:</b> Colorless, odorless flakes or sheets of hydrous silicates.				
<b>Chemical &amp; Physical Properties:</b> MW: 797 (approx) BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 2.6-3.2 VP: 0 mmHg (approx) MLT: ? UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 15 mg/m <sup>3</sup> : Qm 30 mg/m <sup>3</sup> : 95XQ/Sa 75 mg/m <sup>3</sup> : Sa:Cf/PaprHie 150 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ScbaF/SaF 1500 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes; pneumoconiosis, cough, dysp; lass; low-wgt TO: Resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air		



<b>Mineral wool fiber</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> PY8070000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Manmade mineral fibers, Rock wool, Slag wool, Synthetic vitreous fibers [Note: Produced by blowing steam or air through molten rock (rock wool) or various furnace slags that are by-products of metal smelting or refining processes (slag wool).]				
<b>Exposure Limits:</b> NIOSH REL: TWA 3 fibers/cm <sup>3</sup> (fibers ≤ 3.5 µm diameter & ≥ 10 µm in length) TWA 5 mg/m <sup>3</sup> (total) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 7400	
<b>Physical Description:</b> Typically, a mineral "wool" with diameters >0.5 µm & >1.5 µm in length.				
<b>Chemical &amp; Physical Properties:</b> MW: varies BP: NA Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: ? UEL: NA LEL: NA Noncombustible Fibers	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: N.R. Change: Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 5X REL: Qm 10X REL: 95XQ/Sa 25X REL: Sa:Cf/PaprHie 50X REL: 100F/PaprTHie/ScbaF/SaF 1000X REL: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; dysp TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air		

<b>Molybdenum</b>		<b>Formula:</b> Mo	<b>CAS#:</b> 7439-98-7	<b>RTECS#:</b> QA4680000	<b>IDLH:</b> 5000 mg/m <sup>3</sup> (as Mo)
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Molybdenum metal					
<b>Exposure Limits:</b> NIOSH REL*: See Appendix D OSHA PEL*†: TWA 15 mg/m <sup>3</sup> [*Note: The PEL also applies to other insoluble molybdenum compounds (as Mo).]			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G		
<b>Physical Description:</b> Dark gray or black powder with a metallic luster.					
<b>Chemical &amp; Physical Properties:</b> MW: 95.9 BP: 8717°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 10.28 VP: 0 mmHg (approx) MLT: 4752°F UEL: NA LEL: NA Combustible Solid in form of dust or powder.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> OSHA 75 mg/m <sup>3</sup> : Qm 150 mg/m <sup>3</sup> : 95XQ/Sa 375 mg/m <sup>3</sup> : Sa:Cf/PaprHie 750 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 5000 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, nose, throat; anor, diarr, low-wgt; listlessness; liver, kidney damage TO: Eyes, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Resp support Swallow: Medical attention immed		

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<b>Molybdenum (soluble compounds, as Mo)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 1000 mg/m <sup>3</sup> (as Mo)
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific soluble molybdenum compound.					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G		
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble molybdenum compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble molybdenum compound.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> OSHA 25 mg/m <sup>3</sup> : Qm* 50 mg/m <sup>3</sup> : 95XQ*/Sa* 125 mg/m <sup>3</sup> : Sa:Cf*/PaprHie* 250 mg/m <sup>3</sup> : 100F/SaT:Cf*/PaprTHie*/ ScbaF/SaF 1000 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, nose, throat; anor; inco; dysp; anemia TO: Eyes, resp sys, kidneys, blood			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush Breath: Resp support Swallow: Medical attention immed		

<b>Monocrotophos</b>		<b>Formula:</b> C <sub>7</sub> H <sub>14</sub> NO <sub>5</sub> P	<b>CAS#:</b> 6923-22-4	<b>RTECS#:</b> TC4375000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 2783 152 (organophosphorus pesticide, solid)			
<b>Synonyms/Trade Names:</b> Azodrin®, 3-Hydroxy-N-methylcrotonamide dimethylphosphate, Monocron					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.25 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 5600 OSHA PV2045	
<b>Physical Description:</b> Colorless to reddish-brown solid with a mild, ester odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 223.2 BP: 257°F Sol: Miscible F.L.P.: >200°F IP: ? Sp.Gr: ? VP: 0.000007 mmHg MLT: 129°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Metals, low molecular weight alcohols & glycols [Note: Corrosive to black iron, drum steel, stainless steel 304 & brass. Should be stored at 70-80°F.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, miosis, blurred vision; dizz, convuls; dysp; salv, abdom cramps, nau, diarr, vomit; in animals: possible terato effects TO: Eyes, resp sys, CNS, CVS, blood chol, repro sys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

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<b>Monomethyl aniline</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> NHCH <sub>3</sub>	<b>CAS#:</b> 100-61-8	<b>RTECS#:</b> BY4550000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 4.38 mg/m <sup>3</sup>		<b>DOT:</b> 2294 153			
<b>Synonyms/Trade Names:</b> MA, (Methylamino)benzene, N-Methyl aniline, Methylphenylamine, N-Phenylmethylamine					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 ppm (2 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 2 ppm (9 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 3511	
<b>Physical Description:</b> Yellow to light-brown liquid with a weak, ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 107.2 BP: 384°F Sol: Insoluble F.L.P.: 175°F IP: 7.32 eV Sp.Gr: 0.99 VP: 0.3 mmHg FRZ: -71°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 5 ppm: Sa 12.5 ppm: Sa:Cf 25 ppm: SaT:Cf/ScbaF/SaF 100 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids, strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Lass, dizz, head; dysp, cyan; methemo; pulm edema; liver, kidney damage TO: Resp sys, liver, kidneys, blood, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Morpholine</b>		<b>Formula:</b> C <sub>4</sub> H <sub>9</sub> ON	<b>CAS#:</b> 110-91-8	<b>RTECS#:</b> QD6475000	<b>IDLH:</b> 1400 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 3.56 mg/m <sup>3</sup>		<b>DOT:</b> 2054 132			
<b>Synonyms/Trade Names:</b> Diethylene imidoxide; Diethylene oximide; Tetrahydro-1,4-oxazine; Tetrahydro-p-oxazine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 20 ppm (70 mg/m <sup>3</sup> ) [skin] ST 30 ppm (105 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 20 ppm (70 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH S150 (II-3)</b>	
<b>Physical Description:</b> Colorless liquid with a weak, ammonia- or fish-like odor. [Note: A solid below 23°F.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 87.1 <b>BP:</b> 264°F <b>Sol:</b> Miscible <b>Fl.P(oc):</b> 98°F <b>IP:</b> 8.88 eV <b>Sp.Gr:</b> 1.007 <b>VP:</b> 6 mmHg <b>FRZ:</b> 23°F <b>UEL:</b> 11.2% <b>LEL:</b> 1.4% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>15%) Quick drench (>25%)		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>500 ppm:</b> Sa:Cf£/PapOV£ <b>1000 ppm:</b> CcrFOv/GmFOv/PapTOv£/ScbaF/SaF <b>1400 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids, strong oxidizers, metals, nitro compounds [Note: Corrosive to metals.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, resp sys; vis dist; cough; in animals: liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, liver, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Naphtha (coal tar)</b>		<b>Formula:</b>	<b>CAS#:</b> 8030-30-6	<b>RTECS#:</b> DE3030000	<b>IDLH:</b> 1000 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.50 mg/m <sup>3</sup> (approx)		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Crude solvent coal tar naphtha, High solvent naphtha, Naphtha					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (400 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 100 ppm (400 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1550</b>	
<b>Physical Description:</b> Reddish-brown, mobile liquid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 110 (approx) <b>BP:</b> 320-428°F <b>Sol:</b> Insoluble <b>Fl.P:</b> 100-109°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.89-0.97 <b>VP:</b> <5 mmHg <b>FRZ:</b> ? <b>UEL:</b> ? <b>LEL:</b> ? Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>1000 ppm:</b> Sa:Cf£/CcrFOv/GmFOv/PapOV£/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose; dizz, drow; dermat; in animals: liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Naphthalene</b>		<b>Formula:</b> C <sub>10</sub> H <sub>8</sub>	<b>CAS#:</b> 91-20-3	<b>RTECS#:</b> QJ0525000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 5.24 mg/m <sup>3</sup>		<b>DOT:</b> 1334 133 (crude or refined); 2304 133 (molten)			
<b>Synonyms/Trade Names:</b> Naphthalin, Tar camphor, White tar					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (50 mg/m <sup>3</sup> ) ST 15 ppm (75 mg/m <sup>3</sup> ) OSHA PEL†: TWA 10 ppm (50 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1501 OSHA 35	
<b>Physical Description:</b> Colorless to brown solid with an odor of mothballs. [Note: Shipped as a molten solid.]					
<b>Chemical &amp; Physical Properties:</b> MW: 128.2 BP: 424°F Sol: 0.003% Fl.P: 174°F IP: 8.12 eV Sp.Gr: 1.15 VP: 0.08 mmHg MLT: 176°F UEL: 5.9% LEL: 0.9% Combustible Solid, but will take some effort to ignite.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>100 ppm:</b> CcrOv95*/Sa* <b>250 ppm:</b> Sa:Cf*/CcrFOv100/ PaprOvHie*/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chromic anhydride					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes; head, conf, excitement, mal; nau, vomit, abdom pain; irrit bladder; profuse sweat; jaun; hema, renal shutdown; derm, optical neuritis, corn damage TO: Eyes, skin, blood, liver, kidneys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Molten flush immed/sol-liq soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Naphthalene diisocyanate</b>		<b>Formula:</b> C <sub>10</sub> H <sub>6</sub> (NCO) <sub>2</sub>	<b>CAS#:</b> 3173-72-6	<b>RTECS#:</b> NQ9600000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 8.60 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,5-Diisocyanatonaphthalene; 1,5-Naphthalene diisocyanate; 1,5-Naphthalene ester of isocyanic acid; NDI					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.040 mg/m <sup>3</sup> (0.005 ppm) C 0.170 mg/m <sup>3</sup> (0.020 ppm) [10-minute] OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> NIOSH 5525 OSHA PV2046	
<b>Physical Description:</b> White to light-yellow, crystalline flakes.					
<b>Chemical &amp; Physical Properties:</b> MW: 210.2 BP: 505°F Sol: ? Fl.P(oc): 311°F IP: ? Sp.Gr: ? VP(75°F): 0.003 mmHg MLT: 261°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>0.05 ppm:</b> Sa* <b>0.125 ppm:</b> Sa:Cf* <b>0.25 ppm:</b> ScbaF/SaF <b>1 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; resp sens, cough, pulm secretions, chest pain, dysp; asthma TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b><math>\alpha</math>-Naphthylamine</b>		<b>Formula:</b> C <sub>10</sub> H <sub>7</sub> NH <sub>2</sub>	<b>CAS#:</b> 134-32-7	<b>RTECS#:</b> QM1400000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 2077 153			
<b>Synonyms/Trade Names:</b> 1-Aminonaphthalene, 1-Naphthylamine					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1004] See Appendix B				<b>Measurement Methods</b> (see Table 1): NIOSH 5518 OSHA 93	
<b>Physical Description:</b> Colorless crystals with an ammonia-like odor. [Note: Darkens in air to a reddish-purple color.]					
<b>Chemical &amp; Physical Properties:</b> MW: 143.2 BP: 573°F Sol: 0.002% Fl.P: 315°F IP: 7.30 eV Sp.Gr: 1.12 VP(220°F): 1 mmHg MLT: 122°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE  <b>See Appendix E</b> (page 351)	
<b>Incompatibilities and Reactivities:</b> Oxidizes in air					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Derm; hemorrhagic cystitis; dysp, ataxia, methemo, hema; dysuria; [carc] <b>TO:</b> Bladder, skin [bladder cancer]				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

N

<b><math>\beta</math>-Naphthylamine</b>		<b>Formula:</b> C <sub>10</sub> H <sub>7</sub> NH <sub>2</sub>	<b>CAS#:</b> 91-59-8	<b>RTECS#:</b> QM2100000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 1650 153			
<b>Synonyms/Trade Names:</b> 2-Aminonaphthalene, 2-Naphthylamine					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1009] See Appendix B				<b>Measurement Methods</b> (see Table 1): NIOSH 5518 OSHA 93	
<b>Physical Description:</b> Odorless, white to red crystals with a faint, aromatic odor. [Note: Darkens in air to a reddish-purple color.]					
<b>Chemical &amp; Physical Properties:</b> MW: 143.2 BP: 583°F Sol: Miscible in hot water Fl.P: 315°F IP: 9.71 eV Sp.Gr(208°F): 1.06 VP(226°F): 1 mmHg MLT: 232°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE  <b>See Appendix E</b> (page 351)	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Derm; hemorrhagic cystitis; dysp; ataxia; methemo, hema; dysuria; [carc] <b>TO:</b> Bladder, skin [bladder cancer]				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Niax® Catalyst ESN</b>		<b>Formula:</b>	<b>CAS#:</b> 62765-93-9	<b>RTECS#:</b> QR3900000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> None [ <b>Note:</b> A mixture of 95% dimethylaminopropionitrile & 5% bis(2-dimethylamino)ethyl ether.]					
<b>Exposure Limits:</b> NIOSH REL: See Appendix C OSHA PEL: See Appendix C				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> A liquid mixture. [ <b>Note:</b> Used in the past as a catalyst in the manufacture of flexible polyurethane foams.]					
<b>Chemical &amp; Physical Properties:</b> MW: mixture BP: ? Sol: ? Fl.P: ? IP: ? Sp.Gr: ? VP: ? FRZ: ? UEL: ? LEL: ?		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; urinary dist; neurological disorders; pins & needles in hands & feet; musc weak, lass, nau, vomit; decr nerve conduction in lower legs TO: Eyes, skin, urinary tract, PNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Nickel carbonyl</b>		<b>Formula:</b> Ni(CO) <sub>4</sub>	<b>CAS#:</b> 13463-39-3	<b>RTECS#:</b> QR6300000	<b>IDLH:</b> Ca [2 ppm]
<b>Conversion:</b> 1 ppm = 6.98 mg/m <sup>3</sup>		<b>DOT:</b> 1259 131			
<b>Synonyms/Trade Names:</b> Nickel tetracarbonyl, Tetracarbonyl nickel					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.001 ppm (0.007 mg/m <sup>3</sup> ) See Appendix A OSHA PEL: TWA 0.001 ppm (0.007 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 6007	
<b>Physical Description:</b> Colorless to yellow liquid with a musty odor. [ <b>Note:</b> A gas above 110°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 170.7 BP: 110°F Sol: 0.05% Fl.P: <-4°F IP: 8.28 eV Sp.Gr(63°F): 1.32 VP: 315 mmHg FRZ: -13°F UEL: ? LEL: 2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitric acid, bromine, chlorine & other oxidizers; flammable materials					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Abs, Con SY: Head, dizz; nau, vomit, epigastric pain; substernal pain; cough, hyperpnea; cyan; lass; leucyt, pneu; delirium, convuls; [carc]; in animals: repro, terato effects TO: Lungs, paranasal sinus, CNS, repro sys [lung & nasal cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Nickel metal and other compounds (as Ni)</b>	<b>Formula:</b> Ni (metal)	<b>CAS#:</b> 7440-02-0 (metal)	<b>RTECS#:</b> QR5950000 (metal)	<b>IDLH:</b> Ca [10 mg/m <sup>3</sup> (as Ni)]
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Nickel metal: Elemental nickel, Nickel catalyst Synonyms of other nickel compounds vary depending upon the specific compound.				
<b>Exposure Limits:</b> NIOSH REL*: Ca TWA 0.015 mg/m <sup>3</sup> See Appendix A OSHA PEL*†: TWA 1 mg/m <sup>3</sup> [*Note: The REL and PEL do not apply to Nickel carbonyl.]			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
<b>Physical Description:</b> Metal: Lustrous, silvery, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 58.7 BP: 5139°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 8.90 (Metal) VP: 0 mmHg (approx) MLT: 2831°F UEL: NA LEL: NA Metal: Combustible Solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam/Daily Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Sens derm, allergic asthma, pneu; [carc] TO: Nasal cavities, lungs, skin [lung and nasal cancer]			<b>First Aid (see Table 6):</b> Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Nicotine</b>	<b>Formula:</b> C <sub>5</sub> H <sub>7</sub> NC <sub>2</sub> H <sub>7</sub> NCH <sub>3</sub>	<b>CAS#:</b> 54-11-5	<b>RTECS#:</b> QS5250000	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1654 151		
<b>Synonyms/Trade Names:</b> 3-(1-Methyl-2-pyrrolidyl)pyridine				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods (see Table 1):</b> NIOSH 2544, 2551	
<b>Physical Description:</b> Pale-yellow to dark-brown liquid with a fish-like odor when warm. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 162.2 BP: 482°F (Decomposes) Sol: Miscible Fl.P: 203°F IP: 8.01 eV Sp.Gr: 1.01 VP: 0.08 mmHg FRZ: -110°F UEL: 4.0% LEL: 0.7% Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 5 mg/m <sup>3</sup> : Sa/ScbaF ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Nau, salv, abdom pain, vomit, diarr; head, dizz, hearing, vis dist; conf, lass, inco; card arrhy; convuls, dysp; in animals: terato effects TO: CNS, CVS, lungs, GI tract, repro sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Nitric acid</b>	<b>Formula:</b> HNO <sub>3</sub>	<b>CAS#:</b> 7697-37-2	<b>RTECS#:</b> QU5775000	<b>IDLH:</b> 25 ppm
<b>Conversion:</b> 1 ppm = 2.58 mg/m <sup>3</sup>		<b>DOT:</b> 2032 157 (fuming); 2031 157 (other than red fuming)		
<b>Synonyms/Trade Names:</b> Aqua fortis, Engravers acid, Hydrogen nitrate, Red fuming nitric acid (RFNA), White fuming nitric acid (WFNA)				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (5 mg/m <sup>3</sup> ) ST 4 ppm (10 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 2 ppm (5 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 7903 OSHA ID165SG	
<b>Physical Description:</b> Colorless, yellow, or red, fuming liquid with an acrid, suffocating odor. [ <b>Note:</b> Often used in an aqueous solution. Fuming nitric acid is concentrated nitric acid that contains dissolved nitrogen dioxide.]				
<b>Chemical &amp; Physical Properties:</b> MW: 63.0 BP: 181°F Sol: Miscible Fl.P: NA IP: 11.95 eV Sp.Gr(77°F): 1.50 VP: 48 mmHg FRZ: -44°F UEL: NA LEL: NA Noncombustible Liquid, but increases the flammability of combustible materials.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash (pH<2.5) Quick drench (pH<2.5)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>25 ppm:</b> Sa:Cf*/CcrFS <sub>2</sub> /GmFS <sub>2</sub> /ScbaF/SaF <b>§:</b> ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE	
	<b>Incompatibilities and Reactivities:</b> Combustible materials, metallic powders, hydrogen sulfide, carbides, alcohols [ <b>Note:</b> Reacts with water to produce heat. Corrosive to metals.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; delayed pulm edema, pneu, bron; dental erosion TO: Eyes, skin, resp sys, teeth			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

N

<b>Nitric oxide</b>	<b>Formula:</b> NO	<b>CAS#:</b> 10102-43-9	<b>RTECS#:</b> QX0525000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 1.23 mg/m <sup>3</sup>		<b>DOT:</b> 1660 124		
<b>Synonyms/Trade Names:</b> Mononitrogen monoxide, Nitrogen monoxide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 25 ppm (30 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 25 ppm (30 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6014 OSHA ID190	
<b>Physical Description:</b> Colorless gas. [ <b>Note:</b> Shipped as a nonliquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 30.0 BP: -241°F Sol: 5% Fl.P: NA IP: 9.27 eV RGasD: 1.04 VP: 34.2 atm FRZ: -263°F UEL: NA LEL: NA Nonflammable Gas, but will accelerate the burning of combustible materials.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>100 ppm:</b> Sa:C*/CcrFS <sub>2</sub> /PaprS* <sub>2</sub> /GmFS <sub>2</sub> /Sa*/ScbaF <b>§:</b> ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE	
	<b>Incompatibilities and Reactivities:</b> Fluorine, combustible materials, ozone, NH <sub>3</sub> , chlorinated hydrocarbons, metals, carbon disulfide [Note: Reacts with water to form nitric acid. Rapidly converted in air to nitrogen dioxide.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Irrit eyes, wet skin, nose, throat; drow, uncon; methemo TO: Eyes, skin, resp sys, blood, CNS			<b>First Aid (see Table 6):</b> <b>Breath:</b> Resp support	

<b>p-Nitroaniline</b>		<b>Formula:</b> NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub>	<b>CAS#:</b> 100-01-6	<b>RTECS#:</b> BY7000000	<b>IDLH:</b> 300 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1661 153			
<b>Synonyms/Trade Names:</b> para-Aminonitrobenzene, 4-Nitroaniline, 4-Nitrobenzenamine, p-Nitrophenylamine, PNA					
<b>Exposure Limits:</b> NIOSH REL: TWA 3 mg/m <sup>3</sup> [skin] OSHA PEL†: TWA 6 mg/m <sup>3</sup> (1 ppm) [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 5033	
<b>Physical Description:</b> Bright yellow, crystalline powder with a slight ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 138.1 BP: 630°F Sol: 0.08% Fl.P: 390°F IP: 8.85 eV Sp.Gr: 1.42 VP: 0.00002 mmHg MLT: 295°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>30 mg/m<sup>3</sup>:</b> Sa* <b>75 mg/m<sup>3</sup>:</b> Sa;Cf* <b>150 mg/m<sup>3</sup>:</b> ScbaF/SaF <b>300 mg/m<sup>3</sup>:</b> SaF;Pd,Pp <b>§:</b> ScbaF;Pd,Pp/SaF;Pd,Pp;AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong reducers [Note: May result in spontaneous heating of organic materials in the presence of moisture.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit nose, throat; cyan, ataxia; tacar, tachypnea; dysp; irrity; vomit, diarr; convuls; resp arrest; anemia; methemo; jaundice <b>TO:</b> Resp sys, blood, heart, liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Nitrobenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub>	<b>CAS#:</b> 98-95-3	<b>RTECS#:</b> DA6475000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 5.04 mg/m <sup>3</sup>		<b>DOT:</b> 1662 152			
<b>Synonyms/Trade Names:</b> Essence of mirbane, Nitrobenzol, Oil of mirbane					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (5 mg/m <sup>3</sup> ) [skin] OSHA PEL: TWA 1 ppm (5 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 2005, 2017	
<b>Physical Description:</b> Yellow, oily liquid with a pungent odor like paste shoe polish. [Note: A solid below 42°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 123.1 BP: 411°F Sol: 0.2% Fl.P: 190°F IP: 9.92 eV Sp.Gr: 1.20 VP(77°F): 0.3 mmHg FRZ: 42°F UEL: ? LEL(200°F): 1.8% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> N.R. <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>10 ppm:</b> CcrOv*/Sa* <b>25 ppm:</b> Sa;Cf*/PaprOv* <b>50 ppm:</b> CcrFOv/GmFOv/PaprTOv*/ScbaF/SaF <b>200 ppm:</b> SaF;Pd,Pp <b>§:</b> ScbaF;Pd,Pp/SaF;Pd,Pp;AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Concentrated nitric acid, nitrogen tetroxide, caustics, phosphorus pentachloride, chemically-active metals such as tin or zinc					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; anoxia; dermat; anemia; methemo; in animals: liver, kidney damage; testicular effects <b>TO:</b> Eyes, skin, blood, liver, kidneys, CVS, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>4-Nitrobiphenyl</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> NO <sub>2</sub>	<b>CAS#:</b> 92-93-3	<b>RTECS#:</b> DV5600000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> p-Nitrobiphenyl, p-Nitrodiphenyl, 4-Nitrodiphenyl, p-Phenylnitrobenzene, 4-Phenylnitrobenzene, PNB				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1003] See Appendix B			<b>Measurement Methods</b> (see Table 1): NIOSH P&CAM273 (II-4) OSHA PV2082	
<b>Physical Description:</b> White to yellow, needle-like, crystalline solid with a sweetish odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 199.2 BP: 644°F Sol: Insoluble F.I.P: 290°F IP: ? Sp.Gr: ? VP: ? MLT: 237°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> 100F/ScbaE  <b>See Appendix E</b> (page 351)		
<b>Incompatibilities and Reactivities:</b> Strong reducers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, drow, dizz; dysp; ataxia, lass; methemo; urinary burning; acute hemorrhagic cystitis; [carc] TO: Bladder, blood [in animals: bladder tumors]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		



<b>p-Nitrochlorobenzene</b>	<b>Formula:</b> ClC <sub>6</sub> H <sub>4</sub> NO <sub>2</sub>	<b>CAS#:</b> 100-00-5	<b>RTECS#:</b> CZ1050000	<b>IDLH:</b> Ca [100 mg/m <sup>3</sup> ]
<b>Conversion:</b>	<b>DOT:</b> 1578 152			
<b>Synonyms/Trade Names:</b> p-Chloronitrobenzene, 4-Chloronitrobenzene, 1-Chloro-4-nitrobenzene, 4-Nitrochlorobenzene, PCNB, PNCB				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A [skin] OSHA PEL: TWA 1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2005	
<b>Physical Description:</b> Yellow, crystalline solid with a sweet odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 157.6 BP: 468°F Sol: Slight F.I.P: 261°F IP: 9.96 eV Sp.Gr: 1.52 VP(86°F): 0.2 mmHg MLT: 182°F UEL: ? LEL: ? Solid that does not burn, or burns with difficulty.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia; unpleasant taste; anemia; methemo; in animals: hema; spleen, kidney, bone marrow changes; repro effects; [carc] TO: Blood, liver, kidneys, CVS, spleen, bone marrow, repro sys [in animals: vascular & liver tumors]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Nitroethane</b>	<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> NO <sub>2</sub>	<b>CAS#:</b> 79-24-3	<b>RTECS#:</b> KI5600000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 3.07 mg/m <sup>3</sup>		<b>DOT:</b> 2842 129		
<b>Synonyms/Trade Names:</b> Nitroetan				
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (310 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (310 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 2526	
<b>Physical Description:</b> Colorless, oily liquid with a mild, fruity odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 75.1 BP: 237°F Sol: 5% FLP: 82°F IP: 10.88 eV Sp.Gr: 1.05 VP(77°F): 21 mmHg FRZ: -130°F UEL: ? LEL: 3.4% Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1000 ppm:</b> ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> ScbaE	
<b>Incompatibilities and Reactivities:</b> Amines; strong acids, alkalis & oxidizers; hydrocarbons; combustibles; metal oxides				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Derm; in animals: lac; dysp, pulm rales, edema; liver, kidney inj; narco <b>TO:</b> Skin, resp sys, CNS, kidneys, liver			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	
<b>Nitrogen dioxide</b>				
<b>Formula:</b> NO <sub>2</sub>	<b>CAS#:</b> 10102-44-0	<b>RTECS#:</b> QW9800000	<b>IDLH:</b> 20 ppm	
<b>Conversion:</b> 1 ppm = 1.88 mg/m <sup>3</sup>		<b>DOT:</b> 1067 124		
<b>Synonyms/Trade Names:</b> Dinitrogen tetroxide (N <sub>2</sub> O <sub>4</sub> ), Nitrogen peroxide				
<b>Exposure Limits:</b> NIOSH REL: ST 1 ppm (1.8 mg/m <sup>3</sup> ) OSHA PEL†: C 5 ppm (9 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6014 OSHA ID182	
<b>Physical Description:</b> Yellowish-brown liquid or reddish-brown gas (above 70°F) with a pungent, acid odor. [Note: In solid form (below 15°F) it is found structurally as N <sub>2</sub> O <sub>4</sub> .]				
<b>Chemical &amp; Physical Properties:</b> MW: 46.0 BP: 70°F Sol: Reacts FLP: NA IP: 9.75 eV RGasD: 2.62 Sp.Gr: 1.44 (Liquid at 68°F) VP: 720 mmHg FRZ: 15°F UEL: NA LEL: NA Noncombustible Liquid/Gas, but will accelerate the burning of combustible materials.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>20 ppm:</b> Sa:CfE/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE	
<b>Incompatibilities and Reactivities:</b> Combustible material, water, chlorinated hydrocarbons, carbon disulfide, ammonia [Note: Reacts with water to form nitric acid.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; cough, mucoid frothy sputum, decr pulm func, chronic bron, dysp; chest pain; pulm edema, cyan, tachypnea, tacar <b>TO:</b> Eyes, resp sys, CVS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Nitrogen trifluoride</b>	<b>Formula:</b> NF <sub>3</sub>	<b>CAS#:</b> 7783-54-2	<b>RTECS#:</b> QX1925000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 2.90 mg/m <sup>3</sup>	<b>DOT:</b> 2451 122			
<b>Synonyms/Trade Names:</b> Nitrogen fluoride, Trifluoramine, Trifluorammonia				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 ppm (29 mg/m <sup>3</sup> ) OSHA PEL: TWA 10 ppm (29 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a moldy odor. [Note: Shipped as a nonliquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 71.0 BP: -200°F Sol: Slight F.L.P: NA IP: 12.97 eV RGasD: 2.46 VP: >1 atm FRZ: -340°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 100 ppm: CcrS/Sa 250 ppm: Sa:Cf/PapR5 500 ppm: CcrFS/GmFS/PapRTS*/ SaT:C*/ScbaF/SaF 1000 ppm: SaF:Pd,Pp S: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water, oil, grease, oxidizable materials, ammonia, carbon monoxide, methane, hydrogen, hydrogen sulfide, activated charcoal, diborane				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: In animals: anoxia, cyan; methemo; lass, dizz, head; liver, kidney inj TO: Blood, liver, kidneys			<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Nitroglycerine</b>	<b>Formula:</b> CH <sub>2</sub> NO <sub>3</sub> CHNO <sub>2</sub> CH <sub>2</sub> NO <sub>3</sub>	<b>CAS#:</b> 55-63-0	<b>RTECS#:</b> QX2100000	<b>IDLH:</b> 75 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 9.29 mg/m <sup>3</sup>	<b>DOT:</b> 1204 127 (≤ 1% solution in alcohol); 3064 127 (1-5% solution in alcohol)			
<b>Synonyms/Trade Names:</b> Glyceryl trinitrate; NG; 1,2,3-Propanetriol trinitrate; Trinitroglycerine				
<b>Exposure Limits:</b> NIOSH REL: ST 0.1 mg/m <sup>3</sup> [skin] OSHA PEL†: C 0.2 ppm (2 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2507 OSHA 43	
<b>Physical Description:</b> Colorless to pale-yellow, viscous liquid or solid (below 56°F). [Note: An explosive ingredient in dynamite (20-40%) with ethylene glycol dinitrate (80-60%).]				
<b>Chemical &amp; Physical Properties:</b> MW: 227.1 BP: Begins to decompose at 122-140°F Sol: 0.1% F.L.P: Explodes IP: ? Sp.Gr: 1.60 VP: 0.0003 mmHg FRZ: 56°F UEL: ? LEL: ? Explosive Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: Daily Provide: Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 1 mg/m <sup>3</sup> : Sa* 2.5 mg/m <sup>3</sup> : Sa:Cf* 5 mg/m <sup>3</sup> : SaT:Cf*/ScbaF/SaF 75 mg/m <sup>3</sup> : SaF:Pd,Pp S: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Heat, ozone, shock, acids [Note: An OSHA Class A Explosive (1910.109).]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Throb head; dizz; nau, vomit, abdom pain; hypotension; flush; palp; methemo; delirium, CNS depres; angina; skin irrit TO: CVS, blood, skin, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Nitromethane</b>		<b>Formula:</b> CH <sub>3</sub> NO <sub>2</sub>	<b>CAS#:</b> 75-52-5	<b>RTECS#:</b> PA9800000	<b>IDLH:</b> 750 ppm
<b>Conversion:</b> 1 ppm = 2.50 mg/m <sup>3</sup>		<b>DOT:</b> 1261 129			
<b>Synonyms/Trade Names:</b> Nitrocarbol					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL: TWA 100 ppm (250 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2527	
<b>Physical Description:</b> Colorless, oily liquid with a disagreeable odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 61.0 BP: 214°F Sol: 10% Fl.P: 95°F IP: 11.08 eV Sp.Gr: 1.14 VP: 28 mmHg FRZ: -20°F UEL: ? LEL: 7.3% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): OSHA 750 ppm: Sa:CfE/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: ScbaE	
<b>Incompatibilities and Reactivities:</b> Amines; strong acids, alkalis & oxidizers; hydrocarbons & other combustible materials; metallic oxides [Note: Slowly corrodes steel & copper when wet.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Derm; in animals: irrit eyes, resp sys; convuls, narco; liver damage TO: Eyes, skin, CNS, liver				<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	
<b>N</b>					
<b>2-Nitronaphthalene</b>		<b>Formula:</b> C <sub>10</sub> H <sub>7</sub> NO <sub>2</sub>	<b>CAS#:</b> 581-89-5	<b>RTECS#:</b> QJ9760000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 2538 133			
<b>Synonyms/Trade Names:</b> β-Nitronaphthalene					
<b>Exposure Limits:</b> NIOSH REL: Ca* See Appendix A [*Note: Since metabolized to β-Naphthylamine.] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 178.2 BP: ? Sol: Insoluble Fl.P: ? IP: 8.67 eV Sp.Gr: ? VP: ? MLT: 174°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> For "Nitrates" in general: Aluminum, cyanides, esters, phosphorus, tin chlorides, thiocyanates, sodium hypophosphite					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit skin, resp sys; derm; [carc] TO: Skin, resp sys [bladder cancer]				<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>1-Nitropropane</b>	<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> NO <sub>2</sub>	<b>CAS#:</b> 108-03-2	<b>RTECS#:</b> TZ5075000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 3.64 mg/m <sup>3</sup>		<b>DOT:</b> 2608 129		
<b>Synonyms/Trade Names:</b> Nitropropane, 1-NP				
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (90 mg/m <sup>3</sup> ) OSHA PEL: TWA 25 ppm (90 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> OSHA 46	
<b>Physical Description:</b> Colorless liquid with a somewhat disagreeable odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 89.1 BP: 269°F Sol: 1% Fl.P: 96°F IP: 10.81 eV Sp.Gr: 1.00 VP: 8 mmHg FRZ: -162°F UEL: ? LEL: 2.2% Class IC Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 250 ppm: Sa* 625 ppm: Sa: Cf* 1000 ppm: ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: ScbaE	
<b>Incompatibilities and Reactivities:</b> Amines; strong acids, alkalis & oxidizers; hydrocarbons & other combustible materials; metal oxides				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; head, nau, vomit, diarr; in animals: liver, kidney damage TO: Eyes, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>2-Nitropropane</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> CH(NO <sub>2</sub> )	<b>CAS#:</b> 79-46-9	<b>RTECS#:</b> TZ5250000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 3.64 mg/m <sup>3</sup>		<b>DOT:</b> 2608 129		
<b>Synonyms/Trade Names:</b> Dimethylnitromethane, iso-Nitropropane, 2-NP				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: TWA 25 ppm (90 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 2528 OSHA 15, 46	
<b>Physical Description:</b> Colorless liquid with a pleasant, fruity odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 89.1 BP: 249°F Sol: 2% Fl.P: 75°F IP: 10.71 eV Sp.Gr: 0.99 VP: 13 mmHg FRZ: -135°F UEL: 11.0% LEL: 2.6% Class IC Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: ScbaE	
<b>Incompatibilities and Reactivities:</b> Amines; strong acids, alkalis & oxidizers; metal oxides; combustible materials				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, resp sys; head, anor, nau, vomit, diarr; kidney, liver damage; [carc] TO: Eyes, skin, resp sys, CNS, kidneys, liver [in animals: liver tumors]			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>N-Nitrosodimethylamine</b>		<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> N <sub>2</sub> O	<b>CAS#:</b> 62-75-9	<b>RTECS#:</b> IQ0525000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dimethylnitrosamine; N,N-Dimethylnitrosamine; DMNA; N-Methyl-N-nitroso-methanamine; NDMA; N-Nitroso-N,N-dimethylamine					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1016] See Appendix B				<b>Measurement Methods (see Table 1):</b> NIOSH 2522 OSHA 38	
<b>Physical Description:</b> Yellow, oily liquid with a faint, characteristic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 306°F Sol: Soluble Fl.P: ? IP: 8.69 eV Sp.Gr: 1.005 VP: 3 mmHg FRZ: ? UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE  See Appendix E (page 351)	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [Note: Should be stored in dark bottles.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Nau, vomit, diarr, abdom cramps; head; fever; enlarged liver, jaun; decr liver, kidney, pulm func; [carc] TO: Liver, kidneys,lungs [in animals; lung, kidney, liver & nasal cavity tumors]				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>m-Nitrotoluene</b>		<b>Formula:</b> NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 99-08-1	<b>RTECS#:</b> XT2975000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 5.61 mg/m <sup>3</sup>		<b>DOT:</b> 1664 152			
<b>Synonyms/Trade Names:</b> m-Methylnitrobenzene, 3-Methylnitrobenzene, meta-Nitrotoluene, 3-Nitrotoluene					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (11 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 5 ppm (30 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 2005	
<b>Physical Description:</b> Yellow liquid with a weak, aromatic odor. [Note: A solid below 59°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 137.1 BP: 450°F Sol: 0.05% Fl.P: 223°F IP: 9.48 eV Sp.Gr: 1.16 VP: 0.1 mmHg FRZ: 59°F UEL: ? LEL: 1.6% Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 20 ppm: Sa* 50 ppm: Sa:Cf* 100 ppm: SaT:Cf*/ScbaF/SaF 200 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, sulfuric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; head, lass, dizz; ataxia; dysp; tacar; nau, vomit TO: Blood, CNS, CVS, skin, GI tract				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>o-Nitrotoluene</b>		<b>Formula:</b> NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 88-72-2	<b>RTECS#:</b> XT3150000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 5.61 mg/m <sup>3</sup>		<b>DOT:</b> 1664 152			
<b>Synonyms/Trade Names:</b> o-Methylnitrobenzene, 2-Methylnitrobenzene, ortho-Nitrotoluene, 2-Nitrotoluene					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (11 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 5 ppm (30 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2005	
<b>Physical Description:</b> Yellow liquid with a weak, aromatic odor. [Note: A solid below 25°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 137.1 BP: 432°F Sol: 0.07% Fl.P: 223°F IP: 9.43 eV Sp.Gr: 1.16 VP: 0.1 mmHg FRZ: 25°F UEL: ? LEL: 2.2% Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 20 ppm: Sa* 50 ppm: Sa:Cf* 100 ppm: SaT:Cf*/ScbaF/SaF 200 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, sulfuric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; head, lass, dizz; ataxia; dysp; tacar; nau, vomit TO: Blood, CNS, CVS, skin, GI tract				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

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<b>p-Nitrotoluene</b>		<b>Formula:</b> NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 99-99-0	<b>RTECS#:</b> XT3325000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 5.61 mg/m <sup>3</sup>		<b>DOT:</b> 1664 152			
<b>Synonyms/Trade Names:</b> p-Methylnitrobenzene, 4-Methylnitrobenzene, para-Nitrotoluene, 4-Nitrotoluene					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (11 mg/m <sup>3</sup> ) [skin] OSHA PEL†: TWA 5 ppm (30 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH 2005	
<b>Physical Description:</b> Crystalline solid with a weak, aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 137.1 BP: 460°F Sol: 0.04% Fl.P: 223°F IP: 9.50 eV Sp.Gr: 1.12 VP: 0.1 mmHg MLT: 126°F UEL: ? LEL: 1.6% Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 20 ppm: Sa* 50 ppm: Sa:Cf* 100 ppm: SaT:Cf*/ScbaF/SaF 200 ppm: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, sulfuric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Anoxia, cyan; head, lass, dizz; ataxia; dysp; tacar; nau, vomit TO: Blood, CNS, CVS, skin, GI tract				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Nitrous oxide</b>	<b>Formula:</b> N <sub>2</sub> O	<b>CAS#:</b> 10024-97-2	<b>RTECS#:</b> QX1350000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 1.80 mg/m <sup>3</sup>		<b>DOT:</b> 1070 122; 2201 122 (refrigerated liquid)		
<b>Synonyms/Trade Names:</b> Dinitrogen monoxide, Hyponitrous acid anhydride, Laughing gas				
<b>Exposure Limits:</b> NIOSH REL*: TWA 25 ppm (46 mg/m <sup>3</sup> ) (TWA over the time exposed) [*Note: REL for exposure to waste anesthetic gas.] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): NIOSH 3800, 6600 OSHA ID166	
<b>Physical Description:</b> Colorless gas with a slightly sweet odor. [inhalation anesthetic] [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 44.0 BP: -127°F Sol(77°F): 0.1% F.I.P: NA IP: 12.89 eV RGasD: 1.53 VP: 51.3 atm FRZ: -132°F UEL: NA LEL: NA Nonflammable Gas, but supports combustion at elevated temperatures.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Aluminum, boron, hydrazine, lithium hydride, phosphine, sodium				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Dysp; drow, head; asphy; repro effects; liquid: frostbite TO: Resp sys, CNS, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Fresh air	

<b>Nonane</b>	<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	<b>CAS#:</b> 111-84-2	<b>RTECS#:</b> RA6115000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.25 mg/m <sup>3</sup>		<b>DOT:</b> 1920 128		
<b>Synonyms/Trade Names:</b> n-Nonane, Nonyl hydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (1050 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a gasoline-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 128.3 BP: 303°F Sol: Insoluble F.I.P: 88°F IP: 10.21 eV Sp.Gr: 0.72 VP: 3 mmHg FRZ: -60°F UEL: 2.9% LEL: 0.8% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., peroxides, nitrates, perchlorates)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; head, drow, dizz, conf, nau, tremor, inco; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1-Nonanethiol</b>		<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>8</sub> SH	<b>CAS#:</b> 1455-21-6	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.56 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131			
<b>Synonyms/Trade Names:</b> 1-Mercaptononane, n-Nonyl mercaptan, Nonylthiol					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (3.3 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Liquid.					
<b>Chemical &amp; Physical Properties:</b> MW: 160.3 BP: ? Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: ? VP: ? FRZ: ? UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/PaprOv <b>25 ppm:</b> CcrFOv/GmFOv/PaprTOv/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; lass, cyan, incr respiration, nau, Drow, head, vomit TO: Eyes, skin, resp sys, blood, CNS		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed			

<b>Octachloronaphthalene</b>		<b>Formula:</b> C <sub>10</sub> Cl <sub>8</sub>	<b>CAS#:</b> 2234-13-1	<b>RTECS#:</b> QK0250000	<b>IDLH:</b> See Appendix F
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Halowax® 1051; 1,2,3,4,5,6,7,8-Octachloronaphthalene; Perchloronaphthalene					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> ST 0.3 mg/m <sup>3</sup> [skin] OSHA PEL†: TWA 0.1 mg/m <sup>3</sup> [skin]				<b>Measurement Methods</b> (see Table 1): NIOSH S97 (II-2)	
<b>Physical Description:</b> Waxy, pale-yellow solid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 403.7 BP: 770°F Sol: Insoluble Fl.P: NA IP: ? Sp.Gr: 2.00 VP: <1 mmHg MLT: 365°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1 mg/m<sup>3</sup>:</b> Sa/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE  <b>See Appendix F</b>	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Acne-form dermat; liver damage, jaun TO: Skin, liver		<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed			

<b>1-Octadecanethiol</b>		<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>17</sub> SH	<b>CAS#:</b> 2885-00-9	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 11.72 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131 (liquid)			
<b>Synonyms/Trade Names:</b> 1-Mercaptooctadecane, Octadecyl mercaptan, Stearyl mercaptan					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 0.5 ppm (5.9 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL:</b> none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Solid or liquid (above 77°F).					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 286.6 <b>BP:</b> ? <b>Sol:</b> Insoluble <b>F.I.P.:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> 0.85 <b>VP:</b> ? <b>MLT:</b> 77°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/Pap/Ov <b>25 ppm:</b> CcrFOv/GmFOv/PapTOv/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; head, dizz, lass, cyan, nau, convuls <b>TO:</b> Eyes, skin, resp sys, CNS, blood			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Octane</b>		<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>6</sub> CH <sub>3</sub>	<b>CAS#:</b> 111-65-9	<b>RTECS#:</b> RG8400000	<b>IDLH:</b> 1000 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.67 mg/m <sup>3</sup>		<b>DOT:</b> 1262 128			
<b>Synonyms/Trade Names:</b> n-Octane, normal-Octane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 75 ppm (350 mg/m <sup>3</sup> ) C 385 ppm (1800 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL†:</b> TWA 500 ppm (2350 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1500 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a gasoline-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 114.2 <b>BP:</b> 258°F <b>Sol(77°F):</b> 0.00007% <b>F.I.P.:</b> 56°F <b>IP:</b> 9.82 eV <b>Sp.Gr:</b> 0.70 <b>VP:</b> 10 mmHg <b>FRZ:</b> -70°F <b>UEL:</b> 6.5% <b>LEL:</b> 1.0% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>750 ppm:</b> Sa* <b>1000 ppm:</b> Sa:Cf/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, nose; drow; derm; chemical pneu (aspir liquid); in animals: narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1-Octanethiol</b>	<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>7</sub> SH	<b>CAS#:</b> 111-88-6	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.98 mg/m <sup>3</sup>	<b>DOT:</b> 1228 131			
<b>Synonyms/Trade Names:</b> 1-Mercaptooctane, n-Octyl mercaptan, Octylthiol, 1-Octylthiol				
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (3.0 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): NIOSH 2510	
<b>Physical Description:</b> Water-white liquid with a mild odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 146.3 BP: 390°F Sol: Insoluble Fl.P(oc): 115°F IP: ? Sp.Gr: 0.84 VP(212°F): 3 mmHg FRZ: -57°F UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/PaprvOv <b>25 ppm:</b> CcrFOv/GmFOv/PaprvTOv/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; lass, cyan, incr respiration, nau, drow, head, vomit TO: Eyes, skin, resp sys, blood, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Oil mist (mineral)</b>	<b>Formula:</b>	<b>CAS#:</b> 8012-95-1	<b>RTECS#:</b> PY8030000	<b>IDLH:</b> 2500 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Heavy mineral oil mist, Paraffin oil mist, White mineral oil mist				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> ST 10 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5026, 5524	
<b>Physical Description:</b> Colorless, oily liquid aerosol dispersed in air. [Note: Has an odor like burned lubricating oil.]				
<b>Chemical &amp; Physical Properties:</b> MW: Varies BP: 680°F Sol: Insoluble Fl.P(oc): 380°F IP: ? Sp.Gr: 0.90 VP: <0.5 mmHg FRZ: 0°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>50 mg/m<sup>3</sup>:</b> 100XQ/Sa <b>125 mg/m<sup>3</sup>:</b> Sa:Cf/PaprvHie <b>250 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprvTHie/ ScbaF/SaF <b>2500 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air	

<b>Osmium tetroxide</b>	<b>Formula:</b> OsO <sub>4</sub>	<b>CAS#:</b> 20816-12-0	<b>RTECS#:</b> RN1140000	<b>IDLH:</b> 1 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 10.40 mg/m <sup>3</sup>	<b>DOT:</b> 2471 154			
<b>Synonyms/Trade Names:</b> Osmic acid anhydride, Osmium oxide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.002 mg/m <sup>3</sup> (0.0002 ppm) ST 0.006 mg/m <sup>3</sup> (0.0006 ppm) <b>OSHA PEL†:</b> TWA 0.002 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless, crystalline solid or pale-yellow mass with an unpleasant, acrid, chlorine-like odor. [Note: A liquid above 105°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 254.2 BP: 266°F Sol(77°F): 6% Fl.P: NA IP: 12.60 eV Sp.Gr: 5.10 VP: 7 mmHg MLT: 105°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.1 mg/m<sup>3</sup>:</b> CcrFS100/GmFS100/ ScbaF/SaF <b>1 mg/m<sup>3</sup>:</b> SaF: Pd, Pp <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Hydrochloric acid, easily oxidized organic materials [Note: Begins to sublime below BP. Contact with other materials may cause fire.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, resp sys; lac, vis dist; conj; head; cough, dysp; derm <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	
<b>Oxalic acid</b>	<b>Formula:</b> HOCCOOH×2H <sub>2</sub> O	<b>CAS#:</b> 144-62-7	<b>RTECS#:</b> RO2450000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Ethanedioic acid, Oxalic acid (aqueous), Oxalic acid dihydrate				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 mg/m <sup>3</sup> ST 2 mg/m <sup>3</sup> <b>OSHA PEL†:</b> TWA 1 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless, odorless powder or granular solid. [Note: The anhydrous form (COOH) <sub>2</sub> is an odorless, white solid.]				
<b>Chemical &amp; Physical Properties:</b> MW: 126.1 BP: Sublimes Sol: 14% Fl.P: ? IP: ? Sp.Gr: 1.90 VP: <0.001 mmHg MLT: 215°F (Sublimes) UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>25 mg/m<sup>3</sup>:</b> Sa: CfE/PapHieE <b>50 mg/m<sup>3</sup>:</b> 100F/ScbaF/SaF <b>500 mg/m<sup>3</sup>:</b> SaF: Pd, Pp <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, silver compounds, strong alkalis, chlorites [Note: Gives off water of crystallization at 215°F and begins to sublime.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; eye burns; local pain, cyan; shock, collapse, convuls; kidney damage <b>TO:</b> Eyes, skin, resp sys, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Oxygen difluoride</b>	<b>Formula:</b> OF <sub>2</sub>	<b>CAS#:</b> 7783-41-7	<b>RTECS#:</b> RS2100000	<b>IDLH:</b> 0.5 ppm
<b>Conversion:</b> 1 ppm = 2.21 mg/m <sup>3</sup>	<b>DOT:</b> 2190 124			
<b>Synonyms/Trade Names:</b> Difluorine monoxide, Fluorine monoxide, Oxygen fluoride				
<b>Exposure Limits:</b> NIOSH REL: C 0.05 ppm (0.1 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.05 ppm (0.1 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a peculiar, foul odor. [Note: Shipped as a nonliquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 54.0 BP: -230°F Sol: 0.02% F.L.P: NA IP: 13.11 eV RGasD: 1.88 VP: >1 atm FRZ: -371°F UEL: NA LEL: NA Nonflammable Gas, but a strong oxidizer.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 0.5 ppm: Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS <sub>2</sub> /ScbaE		
<b>Incompatibilities and Reactivities:</b> Combustible materials, chlorine, bromine, iodine, platinum, metal oxides, moist air, hydrogen sulfide, hydrocarbons, water [Note: Reacts very slowly with water to form hydrofluoric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; head; pulm edema; eye, skin burns (from contact with the gas under pressure) TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support	

<b>Ozone</b>	<b>Formula:</b> O <sub>3</sub>	<b>CAS#:</b> 10028-15-6	<b>RTECS#:</b> RS8225000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 1.96 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Triatomic oxygen				
<b>Exposure Limits:</b> NIOSH REL: C 0.1 ppm (0.2 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.1 ppm (0.2 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): OSHA ID214	
<b>Physical Description:</b> Colorless to blue gas with a very pungent odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 48.0 BP: -169°F Sol(32°F): 0.001% F.L.P: NA IP: 12.52 eV RGasD: 1.66 VP: >1 atm FRZ: -315°F UEL: NA LEL: NA Nonflammable Gas, but a powerful oxidizer.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1 ppm: CrS <sub>2</sub> /Sa 2.5 ppm: Sa: Cf/PapRS <sub>2</sub> 5 ppm: CrFS <sub>2</sub> /GmFS <sub>2</sub> /SaT: Cf/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS <sub>2</sub> /ScbaE		
<b>Incompatibilities and Reactivities:</b> All oxidizable materials (both organic & inorganic)				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, muc memb; pulm edema; chronic resp disease TO: Eyes, resp sys			<b>First Aid (see Table 6):</b> Eye: Medical attention Breath: Fresh air; 100% O <sub>2</sub>	

<b>Paraffin wax fume</b>	<b>Formula:</b> C <sub>7</sub> H <sub>2n+2</sub>	<b>CAS#:</b> 8002-74-2	<b>RTECS#:</b> RV0350000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Paraffin fume, Paraffin scale fume				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA PV2047	
<b>Physical Description:</b> Paraffin wax is a white to slightly yellowish, odorless solid. [Note: Consists of a mixture of high molecular weight hydrocarbons (e.g., C <sub>30</sub> H <sub>74</sub> ).]				
<b>Chemical &amp; Physical Properties:</b> MW: 350-420 BP: ? Sol: Insoluble FI.P: 390°F IP: ? Sp.Gr: 0.88-0.92 VP: ? MLT: 115-154°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; discomfort, nau TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Resp support	

<b>Paraquat (Paraquat dichloride)</b>	<b>Formula:</b> CH <sub>3</sub> (C <sub>5</sub> H <sub>4</sub> N) <sub>2</sub> CH <sub>3</sub> ×2Cl	<b>CAS#:</b> 1910-42-5	<b>RTECS#:</b> DW2275000	<b>IDLH:</b> 1 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,1'-Dimethyl-4,4'-bipyridinium dichloride; N,N'-Dimethyl-4,4'-bipyridinium dichloride; Paraquat chloride; Paraquat dichloride [Note: Paraquat is a cation (C <sub>12</sub> H <sub>14</sub> N <sub>2</sub> <sup>+</sup> ; 1,1-Dimethyl-4,4-bipyridinium ion); the commercial product is the dichloride salt of paraquat.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> (resp) [skin] OSHA PEL†: TWA 0.5 mg/m <sup>3</sup> (resp) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 5003	
<b>Physical Description:</b> Yellow solid with a faint, ammonia-like odor. [herbicide] [Note: Paraquat may also be found commercially as a methyl sulfate salt C <sub>12</sub> H <sub>14</sub> N <sub>2</sub> ×2CH <sub>3</sub> SO <sub>4</sub> .]				
<b>Chemical &amp; Physical Properties:</b> MW: 257.2 BP: Decomposes Sol: Miscible FI.P: NA IP: ? Sp.Gr: 1.24 VP: <0.0000001 mmHg MLT: 572°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 1 mg/m <sup>3</sup> : CcrOv95*/PapOvHie*/ Sa*/ScbaF §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkylaryl-sulfonate wetting agents [Note: Corrosive to metals. Decomposes in presence of ultraviolet light.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; epis; derm; fingernail damage; irrit GI tract; heart, liver, kidney damage TO: Eyes, skin, resp sys, heart, liver, kidneys, GI tract			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Parathion</b>	<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> O) <sub>2</sub> P(S)OC <sub>6</sub> H <sub>4</sub> NO <sub>2</sub>	<b>CAS#:</b> 56-38-2	<b>RTECS#:</b> TF4550000	<b>IDLH:</b> 10 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> O,O-Diethyl-O(p-nitrophenyl) phosphorothioate; Diethyl parathion; Ethyl parathion; Parathion-ethyl				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.05 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5600 <b>OSHA</b> 62	
<b>Physical Description:</b> Pale-yellow to dark-brown liquid with a garlic-like odor. [ <b>Note:</b> A solid below 43°F. Pesticide that may be absorbed on a dry carrier.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 291.3 <b>BP:</b> 707°F <b>Sol:</b> 0.001% <b>Fl.P(oc):</b> 392°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.27 <b>VP:</b> 0.00004 mmHg <b>FRZ:</b> 43°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>0.5 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>1.25 mg/m<sup>3</sup>:</b> Sa:Cf/PapRovHie <b>2.5 mg/m<sup>3</sup>:</b> CcrFOv100/SaT:Cf/ PapRTOvHie/ScbaF/SaF <b>10 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkaline materials				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; miosis; rhin; head; chest tight, wheez, lar spasm, salv, cyan; anor, nau, vomit, abdom cramps, diarr; sweat; musc fasc, lass, para; dizz, conf, ataxia; convuls, coma; low BP; card irreg <b>TO:</b> Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Particulates not otherwise regulated</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> "Inert" dusts, Nuisance dusts, PNOR [ <b>Note:</b> Includes all inert or nuisance dusts, whether mineral, inorganic, not listed specifically in 1910.1000.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> See Appendix D <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 0500, 0600	
<b>Physical Description:</b> Dusts from solid substances without specific occupational exposure standards.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific solid.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, throat, upper resp sys <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Pentaborane</b>	<b>Formula:</b> B <sub>5</sub> H <sub>9</sub>	<b>CAS#:</b> 19624-22-7	<b>RTECS#:</b> RY8925000	<b>IDLH:</b> 1 ppm
<b>Conversion:</b> 1 ppm = 2.58 mg/m <sup>3</sup>		<b>DOT:</b> 1380 135		
<b>Synonyms/Trade Names:</b> Pentaboron nonahydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.005 ppm (0.01 mg/m <sup>3</sup> ) ST 0.015 ppm (0.03 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.005 ppm (0.01 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid with a pungent odor like sour milk.				
<b>Chemical &amp; Physical Properties:</b> MW: 63.1 BP: 140°F Sol: Reacts Fl.P: 86°F IP: 9.90 eV Sp.Gr: 0.62 VP: 171 mmHg FRZ: -52°F UEL: ? LEL: 0.42% Class IC Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.05 ppm:</b> Sa <b>0.125 ppm:</b> Sa:Cf <b>0.25 ppm:</b> Sa:T:Cf/ScbaF/SaF <b>1 ppm:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, halogens, water, halogenated hydrocarbons [Note: May ignite SPONTANEOUSLY in moist air. Corrosive to natural rubber. Hydrolyzes slowly with heat in water to form boric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; dizz, head, drow, inco, tremor, convuls, behavioral changes; tonic spasm face, neck, abdom, limbs <b>TO:</b> Eyes, skin, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	
<b>P</b>				
<b>Pentachloroethane</b>	<b>Formula:</b> CHCl <sub>2</sub> CCl <sub>3</sub>	<b>CAS#:</b> 76-01-7	<b>RTECS#:</b> Kl6300000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1669 151		
<b>Synonyms/Trade Names:</b> Ethane pentachloride, Pentalin				
<b>Exposure Limits:</b> NIOSH REL: Handle with care in the workplace. See Appendix C (Chloroethanes) OSHA PEL: none			<b>Measurement Methods (see Table 1):</b> NIOSH 2517	
<b>Physical Description:</b> Colorless liquid with a sweetish, chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 202.3 BP: 322°F Sol: 0.05% Fl.P: ? IP: 11.28 eV Sp.Gr: 1.68 VP: 3 mmHg FRZ: -20°F UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> (Sodium-potassium alloy + bromoform), alkalis, metals, water [Note: Hydrolysis produces dichloroacetic acid. Reaction with alkalis & metals produces spontaneously explosive chloroacetylenes.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> In animals: irrit eyes, skin; lass, restless, irreg respiration, musc inco; liver, kidney, lung changes <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Pentachloronaphthalene</b>	<b>Formula:</b> C <sub>10</sub> H <sub>2</sub> Cl <sub>5</sub>	<b>CAS#:</b> 1321-64-8	<b>RTECS#:</b> QK0300000	<b>IDLH:</b> See Appendix F
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Halowax® 1013; 1,2,3,4,5-Pentachloronaphthalene				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH S96 (II-2)	
<b>Physical Description:</b> Pale-yellow or white solid or powder with an aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 300.4 BP: 636°F Sol: Insoluble Fl.P: NA IP: ? Sp.Gr: 1.67 VP: <1 mmHg MLT: 248°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE  <b>See Appendix F</b>	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, lass, dizz, anor; pruritus, acne-form skin eruptions; jaun, liver nec TO: Skin, liver, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap prompt/molten flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical Attention immed		

<b>Pentachlorophenol</b>	<b>Formula:</b> C <sub>6</sub> Cl <sub>5</sub> OH	<b>CAS#:</b> 87-86-5	<b>RTECS#:</b> SM6300000	<b>IDLH:</b> 2.5 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 3155 154			
<b>Synonyms/Trade Names:</b> PCP; Penta; 2,3,4,5,6-Pentachlorophenol				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 5512	
<b>Physical Description:</b> Colorless to white, crystalline solid with a benzene-like odor. [fungicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 266.4 BP: 588°F (Decomposes) Sol: 0.001% Fl.P: NA IP: NA Sp.Gr: 1.98 VP(77°F): 0.0001 mmHg MLT: 374°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2.5 mg/m<sup>3</sup>:</b> CcrOv95*/PaprOvHie*/Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, acids, alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose, throat; sneez, cough; lass, anor, low-wgt; sweat; head, dizz; nau, vomit; dysp, chest pain; high fever; dermat; TO: Eyes, skin, resp sys, CVS, liver, kidneys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Pentaerythritol</b>		<b>Formula:</b> C(CH <sub>2</sub> OH) <sub>4</sub>	<b>CAS#:</b> 115-77-5	<b>RTECS#:</b> RZ2490000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2,2-bis(Hydroxymethyl)-1,3-propanediol; Methane tetramethylol; Monopentaerythritol; PE; Tetrahydroxymethylolmethane; Tetramethylolmethane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL†:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 0500, 0600	
<b>Physical Description:</b> Colorless to white, crystalline, odorless powder. [ <b>Note:</b> Technical grade is 88% monopentaerythritol & 12% dipentaerythritol.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 136.2 <b>BP:</b> Sublimes <b>Sol(59°F):</b> 6% <b>Fl.P.?</b> <b>IP:</b> ? <b>Sp.Gr:</b> 1.38 <b>VP:</b> 0.00000008 mmHg <b>MLT:</b> 500°F (Sublimes) <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Organic acids, oxidizers [ <b>Note:</b> Explosive compound is formed when a mixture of PE & thiophosphoryl chloride is heated.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, resp sys <b>TO:</b> Eyes, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		
<b>P</b>					
<b>n-Pentane</b>		<b>Formula:</b> CH <sub>3</sub> [CH <sub>2</sub> ] <sub>3</sub> CH <sub>3</sub>	<b>CAS#:</b> 109-66-0	<b>RTECS#:</b> RZ9450000	<b>IDLH:</b> 1500 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 2.95 mg/m <sup>3</sup>		<b>DOT:</b> 1265 128			
<b>Synonyms/Trade Names:</b> Pentane, normal-Pentane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 120 ppm (350 mg/m <sup>3</sup> ) C 610 ppm (1800 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL†:</b> TWA 1000 ppm (2950 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1500 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a gasoline-like odor. [ <b>Note:</b> A gas above 97°F. May be utilized as a fuel.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 72.2 <b>BP:</b> 97°F <b>Sol:</b> 0.04% <b>Fl.P.:</b> -57°F <b>IP:</b> 10.34 eV <b>Sp.Gr:</b> 0.63 <b>VP:</b> 420 mmHg <b>FRZ:</b> -202°F <b>UEL:</b> 7.8% <b>LEL:</b> 1.5% Class IA Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>1200 ppm:</b> Sa <b>1500 ppm:</b> Sa:Cf/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose; dermat; chemical pneu (aspir liquid); drow; in animals: narco <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>ER:</b> Irr immed <b>Skin:</b> Water wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1-Pentanethiol</b>	<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>4</sub> SH	<b>CAS#:</b> 110-66-7	<b>RTECS#:</b> SA3150000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.26 mg/m <sup>3</sup>	<b>DOT:</b> 1111 130			
<b>Synonyms/Trade Names:</b> Amyl hydrosulfide, Amyl mercaptan, Amyl sulfhydrate, Pentyl mercaptan				
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (2.1 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Water-white to yellowish liquid with a strong, garlic-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 104.2 BP: 260°F Sol: Insoluble FLP(oc): 65°F IP: ? Sp.Gr: 0.84 VP(77°F): 14 mmHg FRZ: -104°F UEL: ? LEL: ? Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/PapRov <b>25 ppm:</b> CcrFOv/GmFOv/PapRTOv/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, alkali metals, calcium hypochlorite, concentrated nitric acid				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; head, nau, dizz; vomit, diarr; dermat, skin sens TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2-Pentanone</b>	<b>Formula:</b> CH <sub>3</sub> COCH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 107-87-9	<b>RTECS#:</b> SA7875000	<b>IDLH:</b> 1500 ppm
<b>Conversion:</b> 1 ppm = 3.52 mg/m <sup>3</sup>	<b>DOT:</b> 1249 127			
<b>Synonyms/Trade Names:</b> Ethyl acetone, Methyl propyl ketone, MPK				
<b>Exposure Limits:</b> NIOSH REL: TWA 150 ppm (530 mg/m <sup>3</sup> ) OSHA PEL†: TWA 200 ppm (700 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1300, 2555	
<b>Physical Description:</b> Colorless to water-white liquid with a characteristic acetone-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 86.1 BP: 215°F Sol: 6% FLP: 45°F IP: 9.39 eV Sp.Gr: 0.81 VP: 27 mmHg FRZ: -108°F UEL: 8.2% LEL: 1.5% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>1500 ppm:</b> CcrOv*/PapRov*/GmFOv/ Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, bromine trifluoride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; head; dermat; narco, coma TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Perchloromethyl mercaptan</b>		<b>Formula:</b> Cl <sub>3</sub> CSCI	<b>CAS#:</b> 594-42-3	<b>RTECS#:</b> PB0370000	<b>IDLH:</b> 10 ppm
<b>Conversion:</b> 1 ppm = 7.60 mg/m <sup>3</sup>		<b>DOT:</b> 1670 157			
<b>Synonyms/Trade Names:</b> PCM, PMM, Trichloromethane sulfenyl chloride, Trichloromethyl sulfur chloride					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.8 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 0.1 ppm (0.8 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Pale-yellow, oily liquid with an unbearable, acrid odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 185.9 BP: 297°F (Decomposes) Sol: Insoluble Fl.P: NA IP: ? Sp.Gr: 1.69 VP: 3 mmHg FRZ: ? UEL: NA LEL: NA Noncombustible Liquid, but will support combustion.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>1 ppm:</b> CcrOv*/Sa* <b>2.5 ppm:</b> Sa:Cf*/Paprov* <b>5 ppm:</b> CcrFov/GmFov/Paprov*/SaT:Cf*/ScbaF/SaF <b>10 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Alkalis, amines, hot iron, water [Note: Corrosive to most metals. Forms HCl, sulfur & CO <sub>2</sub> on contact with water.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; lac; cough, dysp, deep breath pain, coarse rales; vomit; pallor, tacar; acidosis; anuria; liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, liver, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Perchloryl fluoride</b>		<b>Formula:</b> ClO <sub>2</sub> F	<b>CAS#:</b> 7616-94-6	<b>RTECS#:</b> SD1925000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 4.19 mg/m <sup>3</sup>		<b>DOT:</b> 3083 124			
<b>Synonyms/Trade Names:</b> Chlorine fluoride oxide, Chlorine oxyfluoride, Trioxychlorofluoride					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 3 ppm (14 mg/m <sup>3</sup> ) ST 6 ppm (28 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 3 ppm (13.5 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless gas with a characteristic, sweet odor. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 102.5 BP: -52°F Sol: 0.06% Fl.P: NA IP: 13.60 eV RGasD: 3.64 VP: 10.5 atm FRZ: -234°F UEL: NA LEL: NA Nonflammable Gas, but will support combustion.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>30 ppm:</b> Sa <b>75 ppm:</b> Sa:Cf* <b>100 ppm:</b> ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE	
<b>Incompatibilities and Reactivities:</b> Combustibles, strong bases, amines, finely divided metals, reducing agents, alcohols					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Irrit resp sys; liquid: frostbite; in animals: methemo; cyan; lass, dizz, head; pulm edema; pneu; anoxia <b>TO:</b> Skin, resp sys, blood				<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Perlite</b>	<b>Formula:</b>	<b>CAS#:</b> 93763-70-3	<b>RTECS#:</b> SD5254000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Expanded perlite [ <b>Note:</b> An amorphous material consisting of fused sodium potassium aluminum silicate.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 0500, 0600	
<b>Physical Description:</b> Odorless, light-gray to glassy-black solid. [ <b>Note:</b> Expanded perlite is a fluffy, white particulate.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> varies <b>BP:</b> ? <b>Sol:</b> <1% <b>F.I.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 2.2 - 2.4 (crude) 0.05 - 0.3 (expanded) <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> >2000°F <b>UEL:</b> NA <b>LEL:</b> NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, throat, upper resp sys <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Petroleum distillates (naphtha)</b>	<b>Formula:</b>	<b>CAS#:</b> 8002-05-9	<b>RTECS#:</b> SE7449000	<b>IDLH:</b> 1100 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 4.05 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Aliphatic petroleum naphtha, Petroleum naphtha, Rubber solvent				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 350 mg/m <sup>3</sup> C 1800 mg/m <sup>3</sup> [15-minute] <b>OSHA PEL†:</b> TWA 500 ppm (2000 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1550	
<b>Physical Description:</b> Colorless liquid with a gasoline- or kerosene-like odor. [ <b>Note:</b> A mixture of paraffins (C <sub>5</sub> to C <sub>13</sub> ) that may contain a small amount of aromatic hydrocarbons.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 99 (approx) <b>BP:</b> 86-460°F <b>Sol:</b> Insoluble <b>F.I.P:</b> -40 to -86°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.63-0.66 <b>VP:</b> 40 mmHg (approx) <b>FRZ:</b> -99°F <b>UEL:</b> 5.9% <b>LEL:</b> 1.1% Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>850 ppm:</b> Sa <b>1100 ppm:</b> Sa:Cf*/ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFov/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; dizz, drow, head, nau; dry cracked skin; chemical pneu (aspir liquid) <b>TO:</b> Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phenol</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> OH	<b>CAS#:</b> 108-95-2	<b>RTECS#:</b> SJ3325000	<b>IDLH:</b> 250 ppm
<b>Conversion:</b> 1 ppm = 3.85 mg/m <sup>3</sup>		<b>DOT:</b> 1671 153 (solid); 2312 153 (molten); 2821 153 (solution)			
<b>Synonyms/Trade Names:</b> Carbolic acid, Hydroxybenzene, Monohydroxybenzene, Phenyl alcohol, Phenyl hydroxide					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 ppm (19 mg/m <sup>3</sup> ) [skin] C 15.6 ppm (60 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL:</b> TWA 5 ppm (19 mg/m <sup>3</sup> ) [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 2546</b> <b>OSHA 32</b>	
<b>Physical Description:</b> Colorless to light-pink, crystalline solid with a sweet, acrid odor. [Note: Phenol liquefies by mixing with about 8% water.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 94.1 <b>BP:</b> 359°F <b>Sol(77°F):</b> 9% <b>FLP:</b> 175°F <b>IP:</b> 8.50 eV <b>Sp.Gr:</b> 1.06 <b>VP:</b> 0.4 mmHg <b>MLT:</b> 109°F <b>UEL:</b> 8.6% <b>LEL:</b> 1.8% Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>50 ppm:</b> CcrOv95/Sa <b>125 ppm:</b> Sa:Cf/PapR/OvHie <b>250 ppm:</b> CcrFOv100/GmFOv100/ PapRTOvHie/Scbaf/SaF <b>§:</b> Scbaf: Pd,Pp/SaF: Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbafE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, calcium hypochlorite, aluminum chloride, acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; anor, low-wgt; lass, musc ache, pain; dark urine; cyan; liver, kidney damage; skin burns; dermatitis; tremor, convuls, twitch <b>TO:</b> Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		
<b>P</b>					
<b>Phenothiazine</b>		<b>Formula:</b> S(C <sub>6</sub> H <sub>4</sub> ) <sub>2</sub> NH	<b>CAS#:</b> 92-84-2	<b>RTECS#:</b> SN5075000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dibenzothiazine, Fenothiazine, Thiodiphenylamine					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> [skin] <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> <b>OSHA PV2048</b>	
<b>Physical Description:</b> Grayish-green to greenish-yellow solid. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 199.3 <b>BP:</b> 700°F <b>Sol:</b> Insoluble <b>FLP:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> ? <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 365°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid, but not a high fire risk.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Itching, irrit, reddening skin; hepatitis, hemolytic anemia, abdom cramps, tacar; kidney damage; skin photo sens <b>TO:</b> Skin, CVS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>p-Phenylene diamine</b>	<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (NH <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 106-50-3	<b>RTECS#:</b> SS8050000	<b>IDLH:</b> 25 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1673 153			
<b>Synonyms/Trade Names:</b> 4-Aminoaniline; 1,4-Benzenediamine; p-Diaminobenzene; 1,4-Diaminobenzene; 1,4-Phenylene diamine				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): OSHA 87	
<b>Physical Description:</b> White to slightly red, crystalline solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 108.2 BP: 513°F Sol(75°F): 4% Fl.P: 312°F IP: 6.89 eV Sp.Gr: ? VP: <1 mmHg MLT: 295°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2.5 mg/m<sup>3</sup>:</b> Sa:CfE <b>5 mg/m<sup>3</sup>:</b> ScaF/SaF <b>25 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFS100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit pharynx, larynx; bronchial asthma; sens derm TO: Resp sys, skin			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phenyl ether (vapor)</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> OC <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 101-84-8	<b>RTECS#:</b> KN8970000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 6.96 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Diphenyl ether, Diphenyl oxide, Phenoxy benzene, Phenyl oxide				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (7 mg/m <sup>3</sup> ) OSHA PEL: TWA 1 ppm (7 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1617 OSHA PV2022	
<b>Physical Description:</b> Colorless, crystalline solid or liquid (above 82°F) with a geranium-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 170.2 BP: 498°F Sol: Insoluble Fl.P: 239°F IP: 8.09 eV Sp.Gr: 1.08 VP(77°F): 0.02 mmHg MLT: 82°F UEL: 6.0% LEL: 0.7% Combustible Solid Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>25 ppm:</b> Sa:CfE/PapOvHieE <b>50 ppm:</b> CrFOv100/GmFOv100/ ScaF/SaF <b>100 ppm:</b> SaF:Pd,Pp §: ScaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, skin; nau TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support	

<b>Phenyl ether-biphenyl mixture (vapor)</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> OC <sub>6</sub> H <sub>5</sub> /C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 8004-13-5	<b>RTECS#:</b> DV1500000	<b>IDLH:</b> 10 ppm
<b>Conversion:</b> 1 ppm = 6.79 mg/m <sup>3</sup> (approx)		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Diphenyl oxide-diphenyl mixture, Dowtherm® A					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (7 mg/m <sup>3</sup> ) OSHA PEL: TWA 1 ppm (7 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 2013	
<b>Physical Description:</b> Colorless to straw-colored liquid or solid (below 54°F) with a disagreeable, aromatic odor. [Note: A mixture typically contains 75% phenyl ether & 25% biphenyl.]					
<b>Chemical &amp; Physical Properties:</b> MW: 166 (approx) BP: 495°F Sol: Insoluble F.I.P: 239°F IP: ? Sp.Gr(77°F): 1.06 VP(77°F): 0.08 mmHg FRZ: 54°F UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10 ppm:</b> Sa:CfE/CcrFOv100/GmFOv100/ PaprovHieE/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, skin; nau TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support	

**P**

<b>Phenyl glycidyl ether</b>		<b>Formula:</b> C <sub>9</sub> H <sub>10</sub> O <sub>2</sub>	<b>CAS#:</b> 122-60-1	<b>RTECS#:</b> TZ3675000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 6.14 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2-Epoxy-3-phenoxy propane; Glycidyl phenyl ether; PGE; Phenyl 2,3-epoxypropyl ether					
<b>Exposure Limits:</b> NIOSH REL: Ca C 1 ppm (6 mg/m <sup>3</sup> ) [15-minute] See Appendix A OSHA PEL†: TWA 10 ppm (60 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1619 OSHA 7	
<b>Physical Description:</b> Colorless liquid. [Note: A solid below 38°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 150.1 BP: 473°F Sol: 0.2% F.I.P: 248°F IP: ? Sp.Gr: 1.11 VP: 0.01 mmHg FRZ: 38°F UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> * ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, amines, strong acids, strong bases					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; upper resp sys; skin sens; narco; possible hemato, repro effects; [carc] TO: Eyes, skin, CNS, hemato sys, repro sys [in animals: nasal cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phenylhydrazine</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> NHNH <sub>2</sub>	<b>CAS#:</b> 100-63-0	<b>RTECS#:</b> MV8925000	<b>IDLH:</b> Ca [15 ppm]
<b>Conversion:</b> 1 ppm = 4.42 mg/m <sup>3</sup>	<b>DOT:</b> 2572 153			
<b>Synonyms/Trade Names:</b> Hydrazinobenzene, Monophenylhydrazine				
<b>Exposure Limits:</b> NIOSH REL: Ca C 0.14 ppm (0.6 mg/m <sup>3</sup> ) [2-hr] [skin] See Appendix A OSHA PEL†: TWA 5 ppm (22 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 3518	
<b>Physical Description:</b> Colorless to pale-yellow liquid or solid (below 67°F) with a faint, aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 108.1 BP: 470°F (Decomposes) Sol: Slight Fl.P: 190°F IP: 7.64 eV Sp.Gr: 1.10 VP(77°F): 0.04 mmHg FRZ: 67°F UEL: ? LEL: ? Class IIIA Combustible Liquid Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbAF: Pd, Pp/SaF: Pd, Pp/AScbA <b>Escape:</b> ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, lead dioxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Skin sens, hemolytic anemia, dysp, cyan; jaun; kidney damage; vascular thrombosis; [carc] TO: Blood, resp sys, liver, kidneys, skin [in animals: tumors of the lungs, liver, blood vessels & intestine]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>N-Phenyl-β-naphthylamine</b>	<b>Formula:</b> C <sub>10</sub> H <sub>7</sub> NHC <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 135-88-6	<b>RTECS#:</b> QM4550000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2-Anilino-naphthalene, β-Naphthylphenylamine, PBNA, 2-Phenylaminonaphthalene, Phenyl-β-naphthylamine				
<b>Exposure Limits:</b> NIOSH REL: Ca* See Appendix A [*Note: Since metabolized to β-Naphthylamine.] OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): OSHA 96	
<b>Physical Description:</b> White to yellow crystals or gray to tan flakes or powder. [*Note: Commercial product may contain 20-30 ppm of β-Naphthylamine.]				
<b>Chemical &amp; Physical Properties:</b> MW: 219.3 BP: 743°F Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: 1.24 VP: ? MLT: 226°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbAF: Pd, Pp/SaF: Pd, Pp/AScbA <b>Escape:</b> GmFOV100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irritation; leucoplakia; acne, hypersensitivity to sunlight; [carc] TO: Eyes, skin, bladder [bladder cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phenylphosphine</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> PH <sub>2</sub>	<b>CAS#:</b> 638-21-1	<b>RTECS#:</b> SZ2100000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.50 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Fenylfosfin, PF, Phosphaniline				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 0.05 ppm (0.25 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Clear, colorless liquid with a foul odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 110.1 BP: 320°F Sol: Insoluble Fl.P: ? IP: ? Sp.Gr(59°F): 1.001 VP: ? FRZ: ? UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported [Note: Spontaneously combustible in high concentrations in air. Potential exposure to gaseous PF when polyphosphinates are heated above 392°F.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> In animals: blood changes, anemia, testicular degeneration; loss of appetite, diarr, lac, hind leg tremor; derm <b>TO:</b> Blood, CNS, skin, repro sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

**P**

<b>Phorate</b>	<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> O) <sub>2</sub> P(S)SCH <sub>2</sub> SC <sub>2</sub> H <sub>5</sub>	<b>CAS#:</b> 298-02-2	<b>RTECS#:</b> TD9450000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 3018 152 (organophosphorus pesticide, liquid, toxic)			
<b>Synonyms/Trade Names:</b> O,O-Diethyl S-(ethylthio)methylphosphorodithioate; O,O-Diethyl S-ethylthiomethylthionophosphate; Thimet; Timet				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.05 mg/m <sup>3</sup> ST 0.2 mg/m <sup>3</sup> [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 5600	
<b>Physical Description:</b> Clear liquid with a skunk-like odor. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 260.4 BP: ? Sol: 0.005% Fl.P(oc): 320°F IP: ? Sp.Gr(77°F): 1.16 VP: 0.0008 mmHg FRZ: -45°F UEL: ? LEL: ? Class IIIB Combustible Liquid, but does not readily ignite.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water, alkalis [Note: Hydrolyzed in the presence of moisture and by alkalis.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; miosis; rhin; head; chest tight, wheez, lar spasm, salv, cyan; anor, nau, vomit, abdom cramps, diarr; sweat; musc fasc, lass, para; dizz, conf, ataxia; convuls, coma; low BP; card irreg <b>TO:</b> Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phosdrin</b>	<b>Formula:</b> C <sub>7</sub> H <sub>13</sub> PO <sub>6</sub>	<b>CAS#:</b> 7786-34-7	<b>RTECS#:</b> GQ5250000	<b>IDLH:</b> 4 ppm
<b>Conversion:</b> 1 ppm = 9.17 mg/m <sup>3</sup>	<b>DOT:</b> 2783 152			
<b>Synonyms/Trade Names:</b> 2-Carbomethoxy-1-methylvinyl dimethyl phosphate, Mevinphos [ <b>Note:</b> Commercial product is a mixture of the cis- & trans-isomers.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.01 ppm (0.1 mg/m <sup>3</sup> ) [skin] ST 0.03 ppm (0.3 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 5600</b>	
<b>Physical Description:</b> Pale-yellow to orange liquid with a weak odor. [ <b>Note:</b> Insecticide that may be absorbed on a dry carrier.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 224.2 <b>BP:</b> Decomposes <b>Sol:</b> Miscible <b>Fl.P(oc):</b> 347°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.25 <b>VP:</b> 0.003 mmHg <b>FRZ:</b> 44°F (trans-) 70°F (cis-) <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.1 ppm:</b> Sa <b>0.25 ppm:</b> Sa:Cf <b>0.5 ppm:</b> SaT:Cf/ScbaF/SaF <b>4 ppm:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers [ <b>Note:</b> Corrosive to cast iron, some stainless steels & brass.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; miosis; rhin; head; chest tight, wheez, lar spasms, saliv, cyan; anor, nau, vomit, abdom cramps, diarr; para; ataxia, convuls; low BP, card irreg <b>TO:</b> Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Phosgene</b>	<b>Formula:</b> COCl <sub>2</sub>	<b>CAS#:</b> 75-44-5	<b>RTECS#:</b> SY5600000	<b>IDLH:</b> 2 ppm
<b>Conversion:</b> 1 ppm = 4.05 mg/m <sup>3</sup>	<b>DOT:</b> 1076 125			
<b>Synonyms/Trade Names:</b> Carbon oxychloride, Carbonyl chloride, Carbonyl dichloride, Chloroformyl chloride				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 ppm (0.4 mg/m <sup>3</sup> ) C 0.2 ppm (0.8 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL:</b> TWA 0.1 ppm (0.4 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): <b>OSHA 61</b>	
<b>Physical Description:</b> Colorless gas with a suffocating odor like musty hay. [ <b>Note:</b> A fuming liquid below 47°F. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 98.9 <b>BP:</b> 47°F <b>Sol:</b> Slight <b>Fl.P:</b> NA <b>IP:</b> 11.55 eV <b>RGasD:</b> 3.48 <b>Sp.Gr:</b> 1.43 (Liquid at 32°F) <b>VP:</b> 1.6 atm <b>FRZ:</b> -198°F <b>UEL:</b> NA <b>LEL:</b> NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid) <b>Eyes:</b> Prevent eye contact (liquid) <b>Wash skin:</b> When contam (liquid) <b>Remove:</b> When wet or contam (liquid) <b>Change:</b> N.R. <b>Provide:</b> Quick drench (liquid)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1 ppm:</b> Sa* <b>2 ppm:</b> ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Moisture, alkalis, ammonia, alcohols, copper [ <b>Note:</b> Reacts slowly in water to form hydrochloric acid & carbon dioxide.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Irrit eyes; dry burning throat; vomit; cough, foamy sputum, dysp, chest pain, cyan; liquid: frostbite <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (liquid) <b>Skin:</b> Water flush immed (liquid) <b>Breath:</b> Resp support	

<b>Phosphine</b>	<b>Formula:</b> PH <sub>3</sub>	<b>CAS#:</b> 7803-51-2	<b>RTECS#:</b> SY7525000	<b>IDLH:</b> 50 ppm
<b>Conversion:</b> 1 ppm = 1.39 mg/m <sup>3</sup>		<b>DOT:</b> 2199 119		
<b>Synonyms/Trade Names:</b> Hydrogen phosphide, Phosphorated hydrogen, Phosphorus hydride, Phosphorus trihydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.3 ppm (0.4 mg/m <sup>3</sup> ) ST 1 ppm (1 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.3 ppm (0.4 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> OSHA 1003, ID180	
<b>Physical Description:</b> Colorless gas with a fish- or garlic-like odor. [pesticide] [Note: Shipped as a liquefied compressed gas. Pure compound is odorless.]				
<b>Chemical &amp; Physical Properties:</b> MW: 34.0 BP: -126°F Sol: Slight Fl.P: NA (Gas) IP: 9.96 eV RGasD: 1.18 VP: 41.3 atm FRZ: -209°F UEL: ? LEL: 1.79% Flammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 3 ppm: Sa 7.5 ppm: Sa:Cf 15 ppm: GmFS/ScbaF/SaF 50 ppm: Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Air, oxidizers, chlorine, acids, moisture, halogenated hydrocarbons, copper [Note: May ignite SPONTANEOUSLY on contact with air.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Nau, vomit, abdom pain, diarr; thirst; chest tight, dysp; muscul pain, chills; stupor or syncope; pulm edema; liquid: frostbite TO: Resp sys			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

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<b>Phosphoric acid</b>	<b>Formula:</b> H <sub>3</sub> PO <sub>4</sub>	<b>CAS#:</b> 7664-38-2	<b>RTECS#:</b> TB6300000	<b>IDLH:</b> 1000 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1805 154 (liquid or solution); 3453 154 (solid)		
<b>Synonyms/Trade Names:</b> Orthophosphoric acid, Phosphoric acid (aqueous), White phosphoric acid				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> OSHA PEL†: TWA 1 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7903 OSHA ID165SG	
<b>Physical Description:</b> Thick, colorless, odorless, crystalline solid. [Note: Often used in an aqueous solution.]				
<b>Chemical &amp; Physical Properties:</b> MW: 98.0 BP: 415°F Sol: Miscible Fl.P: NA IP: ? Sp.Gr(77°F): 1.87 (pure) 1.33 (50% solution) VP: 0.03 mmHg MLT: 108°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash (>1.6%) Quick drench (>1.6%)		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 25 mg/m <sup>3</sup> : Sa:Cf* 50 mg/m <sup>3</sup> : 100F/ScbaF/SaF 1000 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong caustics, most metals [Note: Readily reacts with metals to form flammable hydrogen gas. DO NOT MIX WITH SOLUTIONS CONTAINING BLEACH OR AMMONIA.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; eye, skin, burns; derm TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush Immed Breath: Resp support Swallow: Medical attention immed	

<b>Phosphorus (yellow)</b>	<b>Formula:</b> P <sub>4</sub>	<b>CAS#:</b> 7723-14-0	<b>RTECS#:</b> TH3500000	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1381 136			
<b>Synonyms/Trade Names:</b> Elemental phosphorus, White phosphorus				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> OSHA PEL: TWA 0.1 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 7905	
<b>Physical Description:</b> White to yellow, soft, waxy solid with acrid fumes in air. [Note: Usually shipped or stored in water.]				
<b>Chemical &amp; Physical Properties:</b> MW: 124.0 BP: 536°F Sol: 0.0003% Fl.P: ? IP: ? Sp.Gr: 1.82 VP: 0.03 mmHg MLT: 111°F UEL: ? LEL: ? Flammable Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact* [*Note: Flame retardant personal protective equipment should be provided.] <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1 mg/m<sup>3</sup>:</b> Sa <b>2.5 mg/m<sup>3</sup>:</b> Sa,CfE <b>5 mg/m<sup>3</sup>:</b> ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> ScbaE		
<b>Incompatibilities and Reactivities:</b> Air, oxidizers (including elemental sulfur & strong caustics), halogens [Note: Ignites SPONTANEOUSLY in moist air.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, resp tract; eye, skin burns; abdom pain, nau, jaun; anemia; cachexia; dental pain, salv, jaw pain, swell TO: Eyes, skin, resp sys, liver, kidneys, jaw, teeth, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phosphorus oxychloride</b>	<b>Formula:</b> POCl <sub>3</sub>	<b>CAS#:</b> 10025-87-3	<b>RTECS#:</b> TH4897000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.27 mg/m <sup>3</sup>	<b>DOT:</b> 1810 137			
<b>Synonyms/Trade Names:</b> Phosphorus chloride, Phosphorus oxytrichloride, Phosphoryl chloride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.6 mg/m <sup>3</sup> ) ST 0.5 ppm (3 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Clear, colorless to yellow, oily liquid with a pungent & musty odor. [Note: A solid below 34°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 153.3 BP: 222°F Sol: Decomposes Fl.P: NA IP: ? Sp.Gr(77°F): 1.65 VP(81°F): 40 mmHg FRZ: 34°F UEL: NA LEL: NA Noncombustible Liquid, but may set fire to combustible materials.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> Water, combustible materials, carbon disulfide, dimethyl-formamide, metals (except nickel & lead) [Note: Decomposes in water to hydrochloric & phosphoric acids.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; eye, skin burns; dysp, cough, pulm edema; dizz, head, lass; abdom pain, nau, vomit; neph TO: Eyes, skin, resp sys, CNS, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phosphorus pentachloride</b>		<b>Formula:</b> PCl <sub>5</sub>	<b>CAS#:</b> 10026-13-8	<b>RTECS#:</b> TB6125000	<b>IDLH:</b> 70 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1806 137			
<b>Synonyms/Trade Names:</b> Pentachlorophosphorus, Phosphoric chloride, Phosphorus perchloride					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL: TWA 1 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH S257 (II-5)	
<b>Physical Description:</b> White to pale-yellow, crystalline solid with a pungent, unpleasant odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 208.3 BP: Sublimes Sol: Reacts F.I.P.: NA IP: ? Sp.Gr: 3.60 VP(132°F): 1 mmHg MLT: 324°F (Sublimes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 10 mg/m <sup>3</sup> : Sa* 25 mg/m <sup>3</sup> : Sa:Cf* 50 mg/m <sup>3</sup> : ScbaF/SaF 70 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Water, magnesium oxide, chemically-active metals such as sodium and potassium, alkalis, amines [Note: Hydrolyzes in water (even in humid air) to form hydrochloric acid & phosphoric acid. Corrosive to metals.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; bron; derm TO: Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

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<b>Phosphorus pentasulfide</b>		<b>Formula:</b> P <sub>2</sub> S <sub>5</sub> /P <sub>4</sub> S <sub>10</sub>	<b>CAS#:</b> 1314-80-3	<b>RTECS#:</b> TH4375000	<b>IDLH:</b> 250 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1340 139			
<b>Synonyms/Trade Names:</b> Phosphorus persulfide, Phosphorus sulfide, Sulfur phosphide					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> OSHA PEL†: TWA 1 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Greenish-gray to yellow, crystalline solid with an odor of rotten eggs.					
<b>Chemical &amp; Physical Properties:</b> MW: 222.3 (P <sub>2</sub> S <sub>5</sub> ) 444.6 (P <sub>4</sub> S <sub>10</sub> ) BP: 957°F Sol: Reacts F.I.P.: ? IP: ? Sp.Gr: 2.09 VP(572°F): 1 mmHg MLT: 550°F UEL: ? LEL: ? Flammable Solid, which may SPONTANEOUSLY ignite in presence of moisture.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 10 mg/m <sup>3</sup> : Sa* 25 mg/m <sup>3</sup> : Sa:Cf* 50 mg/m <sup>3</sup> : ScbaF/SaF 250 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Water, alcohols, strong oxidizers, acids, alkalis [Note: Reacts with water to form hydrogen sulfide, sulfur dioxide, and phosphoric acid.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; apnea, coma, convuls; conj pain, lac, photo, kerato-conj, corn vesic; dizz; head; lass; irrity, insom; GI dist TO: Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Dust off solid; water flush Breath: Resp support Swallow: Medical attention immed	

<b>Phosphorus trichloride</b>	<b>Formula:</b> PCl <sub>3</sub>	<b>CAS#:</b> 7719-12-2	<b>RTECS#:</b> TH3675000	<b>IDLH:</b> 25 ppm
<b>Conversion:</b> 1 ppm = 5.62 mg/m <sup>3</sup>		<b>DOT:</b> 1809 137		
<b>Synonyms/Trade Names:</b> Phosphorus chloride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 ppm (1.5 mg/m <sup>3</sup> ) ST 0.5 ppm (3 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.5 ppm (3 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6402	
<b>Physical Description:</b> Colorless to yellow, fuming liquid with an odor like hydrochloric acid.				
<b>Chemical &amp; Physical Properties:</b> MW: 137.4 BP: 169°F Sol: Reacts FI.P: NA IP: 9.91 eV Sp.Gr: 1.58 VP: 100 mmHg FRZ: -170°F UEL: NA LEL: NA Noncombustible Liquid; however, a strong oxidizer that may ignite combustibles upon contact.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>10 ppm:</b> ScbaF/SaF <b>25 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFS <sub>2</sub> /ScbaE
		<b>Incompatibilities and Reactivities:</b> Water, chemically-active metals such as sodium & potassium, aluminum, strong nitric acid, acetic acid, organic matter [ <b>Note:</b> Hydrolyzes in water to form hydrochloric acid and phosphoric acid.]		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; pulm edema; eye, skin burns TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Phthalic anhydride</b>	<b>Formula:</b> C <sub>8</sub> H <sub>4</sub> (CO) <sub>2</sub> O	<b>CAS#:</b> 85-44-9	<b>RTECS#:</b> TI3150000	<b>IDLH:</b> 60 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 6.06 mg/m <sup>3</sup>		<b>DOT:</b> 2214 156		
<b>Synonyms/Trade Names:</b> 1,2-Benzenedicarboxylic anhydride; PAN; Phthalic acid anhydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 6 mg/m <sup>3</sup> (1 ppm) OSHA PEL†: TWA 12 mg/m <sup>3</sup> (2 ppm)			<b>Measurement Methods</b> (see Table 1): NIOSH S179 (II-3) OSHA 90	
<b>Physical Description:</b> White solid (flake) or a clear, colorless, mobile liquid (molten) with a characteristic, acrid odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 148.1 BP: 563°F Sol: 0.6% FI.P: 305°F IP: 10.00 eV Sp.Gr: 1.53 (Flake) 1.20 (Molten) VP: 0.0015 mmHg MLT: 267°F UEL: 10.5% LEL: 1.7% Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>30 mg/m<sup>3</sup>:</b> Qm* <b>60 mg/m<sup>3</sup>:</b> 95XQ*/95F/Pap/Hie*/ Sa*/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, water [ <b>Note:</b> Converted to phthalic acid in hot water.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; conj; nasal ulcer bleeding; bron, bronchial asthma; dermat; in animals: liver, kidney damage TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>m-Phthalodinitrile</b>		<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (CN) <sub>2</sub>	<b>CAS#:</b> 626-17-5	<b>RTECS#:</b> CZ1900000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,3-Benzenedicarbonitrile; m-Dicyanobenzene; 1,3-Dicyanobenzene; Isophthalodinitrile; m-PDN					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Needle-like, colorless to white, crystalline, flaky solid with an almond-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 128.1 BP: Sublimes Sol: Slight Fl.P: ? IP: ? Sp.Gr: 4.42 VP: 0.01 mmHg MLT: 324°F (Sublimes) UEL: ? LEL: ? Combustible Solid and a severe explosion hazard.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., chlorine, bromine, fluorine)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, nau, conf; in animals: irrit eyes, skin TO: Eyes, skin, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

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<b>Picloram</b>		<b>Formula:</b> C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub> O <sub>2</sub> N <sub>2</sub>	<b>CAS#:</b> 1918-02-1	<b>RTECS#:</b> TJ7525000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4-Amino-3,5,6-trichloropicolinic acid; 4-Amino-3,5,6-trichloro-2-picolinic acid; ATCP; Tordon®					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Colorless to white crystals with a chlorine-like odor. [herbicide]					
<b>Chemical &amp; Physical Properties:</b> MW: 241.5 BP: Decomposes Sol: 0.04% Fl.P: ? IP: ? Sp.Gr: ? VP(95°F): 0.0000006 mmHg MLT: 424°F (Decomposes) UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Hot concentrated alkali (hydrolyzes)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; nau; in animals: liver, kidney changes TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air Swallow: Medical attention immed		

<b>Picric acid</b>	<b>Formula:</b> (NO <sub>2</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> OH	<b>CAS#:</b> 88-89-1	<b>RTECS#:</b> TJ7875000	<b>IDLH:</b> 75 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 9.37 mg/m <sup>3</sup>	<b>DOT:</b> 1344 113 (wet, ≥ 10% water); 3364 113 (wetted, ≥ 10% water)			
<b>Synonyms/Trade Names:</b> Phenol trinitrate; 2,4,6-Trinitrophenol [ <b>Note:</b> An OSHA Class A Explosive (1910.109.)]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> ST 0.3 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH S228</b> (II-4)	
<b>Physical Description:</b> Yellow, odorless solid. [ <b>Note:</b> Usually used as an aqueous solution.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 229.1 <b>BP:</b> Explodes above 572°F <b>Sol:</b> 1% <b>Fl.P:</b> 302°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.76 <b>VP(383°F):</b> 1 mmHg <b>MLT:</b> 252°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.5 mg/m<sup>3</sup>:</b> Qm <b>1 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>2.5 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>5 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/ ScbaF/SaF <b>75 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Copper, lead, zinc & other metals; salts; plaster; concrete; ammonia [ <b>Note:</b> Corrosive to metals. An explosive mixture results when the aqueous solution crystallizes.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; sens derm; yellow-stained hair, skin; lass, myalgia, anuria, polyuria; bitter taste, GI dist; hepatitis, hema, album, neph <b>TO:</b> Eyes, skin, kidneys, liver, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Pindone</b>	<b>Formula:</b> C <sub>9</sub> H <sub>5</sub> O <sub>2</sub> C(O)C(CH <sub>3</sub> ) <sub>3</sub>	<b>CAS#:</b> 83-26-1	<b>RTECS#:</b> NK6300000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> tert-Butyl valone; 1,3-Dioxo-2-pivaloy-lindane; Pival®; Pivalyl; 2-Pivalyl-1,3-indandione				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 0.1 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Bright-yellow powder with almost no odor. [rodenticide]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 230.3 <b>BP:</b> Decomposes <b>Sol(77°F):</b> 0.002% <b>Fl.P:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> 1.06 <b>VP:</b> Very low <b>MLT:</b> 230°F <b>UEL:</b> ? <b>LEL:</b> ?	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.5 mg/m<sup>3</sup>:</b> Qm <b>1 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>2.5 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>5 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/ ScbaF/SaF <b>100 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing <b>SY:</b> Epis, excess bleeding from minor cuts, bruises; smoky urine, black tarry stools; abdom, back pain <b>TO:</b> Blood prothrombin			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Piperazine dihydrochloride</b>		<b>Formula:</b> C <sub>4</sub> H <sub>10</sub> N <sub>2</sub> ×2HCl	<b>CAS#:</b> 142-64-3	<b>RTECS#:</b> TL4025000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Piperazine hydrochloride [ <b>Note:</b> The monochloride, C <sub>4</sub> H <sub>10</sub> N <sub>2</sub> ×HCl is also commercially available.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> White to cream-colored needles or powder.					
<b>Chemical &amp; Physical Properties:</b> MW: 159.1 BP: ? Sol: 41% Fl.P: ? IP: ? Sp.Gr: ? VP: ? MLT: 635°F UEL: ? LEL: ? Combustible Solid, but does not ignite easily.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water [ <b>Note:</b> Slightly hygroscopic (i.e., absorbs moisture from the air).]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; skin burns, sens; asthma; GI upset, head, nau, vomit, inco, musc weak TO: Eyes, skin, resp sys, CNS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Plaster of Paris</b>		<b>Formula:</b> CaSO <sub>4</sub> •0.5H <sub>2</sub> O	<b>CAS#:</b> 26499-65-0	<b>RTECS#:</b> TP0700000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Calcium sulfate hemihydrate, Dried calcium sulfate, Gypsum hemihydrate, Hemihydrate gypsum [ <b>Note:</b> Plaster of Paris is the hemihydrate form of Calcium Sulfate & Gypsum is the dihydrate form.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)				<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> White or yellowish, finely divided, odorless powder.					
<b>Chemical &amp; Physical Properties:</b> MW: 145.2 BP: ? Sol(77°F): 0.3% Fl.P: NA IP: NA Sp.Gr: 2.5 VP: 0 mmHg (approx) MLT: 325°F (Loses H <sub>2</sub> O) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Moisture, water [ <b>Note:</b> Hygroscopic (i.e., absorbs moisture from the air). Reacts with water to form Gypsum.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb, resp sys; cough TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Platinum</b>	<b>Formula:</b> Pt	<b>CAS#:</b> 7440-06-4	<b>RTECS#:</b> TP2160000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Platinum black, Platinum metal, Platinum sponge				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7303 OSHA ID121, ID130SG	
<b>Physical Description:</b> Silvery, whitish-gray, malleable, ductile metal.				
<b>Chemical &amp; Physical Properties:</b> MW: 195.1 BP: 6921°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 21.45 VP: 0 mmHg (approx) MLT: 3222°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but finely divided powder can be dangerous to handle.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> Aluminum, acetone, arsenic, ethane, hydrazine, hydrogen peroxide, lithium, phosphorus, selenium, tellurium, various fluorides				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit skin, resp sys; derm TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Platinum (soluble salts, as Pt)</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 4 mg/m <sup>3</sup> (as Pt)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific soluble platinum salt.				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.002 mg/m <sup>3</sup> OSHA PEL: TWA 0.002 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7303, S191 (II-7)	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble platinum salt.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble platinum salt.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 0.05 mg/m <sup>3</sup> : Sa:CfE 0.1 mg/m <sup>3</sup> : 100F/ScbaF/SaF 4 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, nose; cough, dysp, wheez, cyan; derm, sens skin; lymphocytosis TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>Portland cement</b>	<b>Formula:</b>	<b>CAS#:</b> 65997-15-1	<b>RTECS#:</b> VV8770000	<b>IDLH:</b> 5000 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cement, Hydraulic cement, Portland cement silicate [ <b>Note:</b> A class of hydraulic cements containing tri- and dicalcium silicate in addition to alumina, tricalcium aluminate, and iron oxide.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 50 mppcf			<b>Measurement Methods (see Table 1):</b> NIOSH 0500 OSHA ID207	
<b>Physical Description:</b> Gray, odorless powder.				
<b>Chemical &amp; Physical Properties:</b> MW: ? BP: NA Sol: Insoluble FI.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: NA UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 50 mg/m <sup>3</sup> : Qm 100 mg/m <sup>3</sup> : 95XQ/Sa 250 mg/m <sup>3</sup> : Sa:Cf/PaprHie 500 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ - ScbaF/SaF 5000 mg/m <sup>3</sup> : Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; cough, expectoration; exertional dysp, wheez, chronic bron; derm TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Fresh air Swallow: Medical attention immed		

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<b>Potassium cyanide (as CN)</b>	<b>Formula:</b> KCN	<b>CAS#:</b> 151-50-8	<b>RTECS#:</b> TS8750000	<b>IDLH:</b> 25 mg/m <sup>3</sup> (as CN)
<b>Conversion:</b>	<b>DOT:</b> 1680 157 (solid); 3413 157 (solution)			
<b>Synonyms/Trade Names:</b> Potassium salt of hydrocyanic acid				
<b>Exposure Limits:</b> NIOSH REL*: C 5 mg/m <sup>3</sup> (4.7 ppm) [10-minute] OSHA PEL*: TWA 5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other cyanides (as CN) except Hydrogen cyanide.]			<b>Measurement Methods (see Table 1):</b> NIOSH 6010, 7904	
<b>Physical Description:</b> White, granular or crystalline solid with a faint, almond-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 65.1 BP: 2957°F Sol(77°F): 72% FI.P: NA IP: NA Sp.Gr: 1.55 VP: 0 mmHg (approx) MLT: 1173°F UEL: NA LEL: NA Noncombustible Solid, but contact with acids releases highly flammable hydrogen cyanide.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 25 mg/m <sup>3</sup> : Sa/ScbaF ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as acids, acid salts, chlorates & nitrates) [ <b>Note:</b> Absorbs moisture from the air forming a syrup.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, upper resp sys; asphy; lass, head, conf; nau, vomit; incr resp rate, slow gasping respiration; thyroid, blood changes TO: Eyes, skin, resp sys, CVS, CNS, thyroid, blood		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>Potassium hydroxide</b>	<b>Formula:</b> KOH	<b>CAS#:</b> 1310-58-3	<b>RTECS#:</b> TT2100000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 1813 154 (dry, solid); 1814 154 (solution)			
<b>Synonyms/Trade Names:</b> Caustic potash, Lye, Potassium hydrate				
<b>Exposure Limits:</b> NIOSH REL: C 2 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 7401	
<b>Physical Description:</b> Odorless, white or slightly yellow lumps, rods, flakes, sticks, or pellets. [Note: May be used as an aqueous solution.]				
<b>Chemical &amp; Physical Properties:</b> MW: 56.1 BP: 2415°F Sol(59°F): 107% F.L.P: NA IP: ? Sp.Gr: 2.04 VP(131°F): 1 mmHg MLT: 716°F UEL: NA LEL: NA Noncombustible Solid; however, may react with H <sub>2</sub> O & other substances and generate sufficient heat to ignite combustible materials.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Acids, water, metals (when wet), halogenated hydrocarbons, maleic anhydride [Note: Heat is generated if KOH comes in contact with H <sub>2</sub> O & CO <sub>2</sub> from the air.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; cough, sneez; eye, skin burns; vomit, diarr TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Propane</b>	<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 74-98-6	<b>RTECS#:</b> TX2275000	<b>IDLH:</b> 2100 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 1.80 mg/m <sup>3</sup>	<b>DOT:</b> 1075 115; 1978 115			
<b>Synonyms/Trade Names:</b> Bottled gas, Dimethyl methane, n-Propane, Propyl hydride				
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (1800 mg/m <sup>3</sup> ) OSHA PEL: TWA 1000 ppm (1800 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S87 (II-2) OSHA PV2077	
<b>Physical Description:</b> Colorless, odorless gas. [Note: A foul-smelling odorant is often added when used for fuel purposes. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 44.1 BP: -44°F Sol: 0.01% F.L.P: NA (Gas) IP: 11.07 eV RGasD: 1.55 VP(70°F): 8.4 atm FRZ: -306°F UEL: 9.5% LEL: 2.1% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 2100 ppm: Sa/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Dizz, conf, excitation, asphy; liquid: frostbite TO: CNS			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Propane sultone</b>		<b>Formula:</b> C <sub>3</sub> H <sub>6</sub> O <sub>3</sub> S	<b>CAS#:</b> 1120-71-4	<b>RTECS#:</b> RP5425000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 3-Hydroxy-1-propanesulphonic acid sultone; 1,3-Propane sultone					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> White, crystalline solid or a colorless liquid (above 86°F). [Note: Releases a foul odor as it melts.]					
<b>Chemical &amp; Physical Properties:</b> MW: 122.2 BP: ? Sol: 10% F.L.P: >235°F IP: ? Sp.Gr: 1.39 VP: ? MLT: 86°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; [carc] TO: Eyes, skin, resp sys [in animals: skin tumors, leukemia, gliomas]				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

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<b>1-Propanethiol</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> SH	<b>CAS#:</b> 107-03-9	<b>RTECS#:</b> TZ7300000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.12 mg/m <sup>3</sup>		<b>DOT:</b> 2402 130			
<b>Synonyms/Trade Names:</b> 3-Mercaptopropane, Propane-1-thiol, Propyl mercaptan, n-Propyl mercaptan					
<b>Exposure Limits:</b> NIOSH REL: C 0.5 ppm (1.6 mg/m <sup>3</sup> ) [15-minute] OSHA PEL: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid with an offensive, cabbage-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 76.2 BP: 153°F Sol: Slight F.L.P: -5°F IP: 9.195 eV Sp.Gr: 0.84 VP(77°F): 155 mmHg FRZ: -172°F UEL: ? LEL: ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 5 ppm: CcrOv/Sa 12.5 ppm: Sa:Cf/PaprvOv 25 ppm: CcrFOv/GmFOv/PaprvTOv/ ScbaF/SaF ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals, calcium hypochlorite					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; head, nau, dizz, cyan; in animals: liver, kidney damage TO: Eyes, skin, resp sys, CNS, blood, liver, kidneys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

<b>Propargyl alcohol</b>	<b>Formula:</b> C <sub>3</sub> H <sub>3</sub> OH	<b>CAS#:</b> 107-19-7	<b>RTECS#:</b> UK5075000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.29 mg/m <sup>3</sup>	<b>DOT:</b> 1986 131			
<b>Synonyms/Trade Names:</b> 1-Propyn-3-ol; 2-Propyn-1-ol; 2-Propynyl alcohol				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (2 mg/m <sup>3</sup> ) [skin] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA 97	
<b>Physical Description:</b> Colorless to straw-colored liquid with a mild, geranium odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 56.1 BP: 237°F Sol: Miscible Fl.P(oc): 97°F IP: 10.51 eV Sp.Gr: 0.97 VP: 12 mmHg FRZ: -62°F UEL: ? LEL: ? Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Phosphorus pentoxide, oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit skin, muc memb; CNS depres; in animals: liver, kidney damage TO: Skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>β-Propiolactone</b>	<b>Formula:</b> C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	<b>CAS#:</b> 57-57-8	<b>RTECS#:</b> RQ7350000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> BPL; Hydroacrylic acid, β-lactone; 3-Hydroxy-β-lactone; 3-Hydroxy-propionic acid; β-Lactone; 2-Oxetanone; 3-Propiolactone				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1013] See Appendix B			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a slightly sweet odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 72.1 BP: 323°F (Decomposes) Sol: 37% Fl.P: 165°F IP: ? Sp.Gr: 1.15 VP(77°F): 3 mmHg FRZ: -28°F UEL: ? LEL: 2.9% Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ✖: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOV/ScbaE  <b>See Appendix E</b> (page 351)	
<b>Incompatibilities and Reactivities:</b> Acetates, halogens, thiocyanates, thiosulfates [Note: May polymerize upon storage.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Skin irrit, blistering, burns; corn opac; frequent urination; dysuria; hema; [carc] TO: Kidneys, skin, lungs, eyes [in animals: tumors of the liver, skin & stomach]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Propionic acid</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> COOH	<b>CAS#:</b> 79-09-4	<b>RTECS#:</b> UE5950000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.03 mg/m <sup>3</sup>		<b>DOT:</b> 1848 132			
<b>Synonyms/Trade Names:</b> Carboxyethane, Ethanecarboxylic acid, Ethylformic acid, Metacetic acid, Methyl acetic acid, Propanoic acid					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 ppm (30 mg/m <sup>3</sup> ) ST 15 ppm (45 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless, oily liquid with a pungent, disagreeable, rancid odor. [ <b>Note:</b> A solid below 5°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 74.1 BP: 286°F Sol: Miscible Fl.P: 126°F IP: 10.24 eV Sp.Gr: 0.99 VP: 3 mmHg FRZ: 5°F UEL: 12.1% LEL: 2.9% Class II Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Alkalis, strong oxidizers (e.g., chromium trioxide) [ <b>Note:</b> Corrosive to steel.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; blurred vision, corn burns; skin burns; abdom pain, nau, vomit <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Propionitrile</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CN	<b>CAS#:</b> 107-12-0	<b>RTECS#:</b> UF9625000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.25 mg/m <sup>3</sup>		<b>DOT:</b> 2404 131			
<b>Synonyms/Trade Names:</b> Cyanoethane, Ethyl cyanide, Propanenitrile, Propionic nitrile, Propionitrile					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 6 ppm (14 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> none				<b>Measurement Methods (see Table 1):</b> <b>NIOSH 1606 (adapt)</b>	
<b>Physical Description:</b> Colorless liquid with a pleasant, sweetish, ethereal odor. [ <b>Note:</b> Forms cyanide in the body.]					
<b>Chemical &amp; Physical Properties:</b> MW: 55.1 BP: 207°F Sol: 11.9% Fl.P: 36°F IP: 11.84 eV Sp.Gr: 0.78 VP: 35 mmHg FRZ: -133°F UEL: ? LEL: 3.1% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>60 ppm:</b> CrOv/Sa <b>150 ppm:</b> Sa:Cf/PapRov <b>300 ppm:</b> CrFOv/GmFOv/PapRTOv/ ScbaF/SaF <b>1000 ppm:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers & reducing agents, strong acids & bases [ <b>Note:</b> Hydrogen cyanide is produced when propionitrile is heated to decomposition.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; nau, vomit; chest pain; lass; stupor, convuls; in animals: liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, CVS, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Propoxur</b>		<b>Formula:</b> CH <sub>3</sub> NHCOOC <sub>6</sub> H <sub>4</sub> OCH(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 114-26-1	<b>RTECS#:</b> FC3150000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Aprocarb®, o-Isopropoxyphenyl-N-methylcarbamate, N-Methyl-2-isopropoxyphenyl-carbamate					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 5601 OSHA PV2007	
<b>Physical Description:</b> White to tan, crystalline powder with a faint, characteristic odor. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> MW: 209.3 BP: Decomposes Sol: 0.2% Fl.P: >300°F IP: ? Sp.Gr: ? VP: 0.000007 mmHg MLT: 187-197°F UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis [Note: Emits highly toxic methyl isocyanate fumes when heated to decomposition.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Miosis, blurred vision; sweat, saliv; abdom cramps, nau, diarr, vomit; head, lass, musc twitch TO: CNS, liver, kidneys, GI tract, blood chol			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

<b>n-Propyl acetate</b>		<b>Formula:</b> CH <sub>3</sub> COOCH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	<b>CAS#:</b> 109-60-4	<b>RTECS#:</b> AJ3675000	<b>IDLH:</b> 1700 ppm
<b>Conversion:</b> 1 ppm = 4.18 mg/m <sup>3</sup>		<b>DOT:</b> 1276 129			
<b>Synonyms/Trade Names:</b> Propylacetate, n-Propyl ester of acetic acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (840 mg/m <sup>3</sup> ) ST 250 ppm (1050 mg/m <sup>3</sup> ) OSHA PEL†: TWA 200 ppm (840 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1450 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a mild, fruity odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 102.2 BP: 215°F Sol: 2% Fl.P: 55°F IP: 10.04 eV Sp.Gr: 0.84 VP: 25 mmHg FRZ: -134°F UEL: 8% LEL(100°F): 1.7% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1700 ppm: Sa:Cf£/CcrFOv/GmFOv/ PaprOv£/ScbaF/SaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Nitrates; strong oxidizers, alkalis & acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, nose, throat; narco; derm TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

<b>n-Propyl alcohol</b>		<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<b>CAS#:</b> 71-23-8	<b>RTECS#:</b> UH8225000	<b>IDLH:</b> 800 ppm
<b>Conversion:</b> 1 ppm = 2.46 mg/m <sup>3</sup>		<b>DOT:</b> 1274 129			
<b>Synonyms/Trade Names:</b> Ethyl carbinol, 1-Propanol, n-Propanol, Propyl alcohol					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 200 ppm (500 mg/m <sup>3</sup> ) [skin] ST 250 ppm (625 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 200 ppm (500 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1401, 1405 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a mild, alcohol-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 60.1 <b>BP:</b> 207°F <b>Sol:</b> Miscible <b>Fl.P:</b> 72°F <b>IP:</b> 10.15 eV <b>Sp.Gr:</b> 0.81 <b>VP:</b> 15 mmHg <b>FRZ:</b> -196°F <b>UEL:</b> 13.7% <b>LEL:</b> 2.2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>800 ppm:</b> CcrOv*/Paprov*/GmFOv/Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; dry cracking skin; drow, head; ataxia, GI pain; abdom cramps, nau, vomit, diarr; in animals: narco <b>TO:</b> Eyes, skin, resp sys, GI tract, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>P Propylene dichloride</b>		<b>Formula:</b> CH <sub>2</sub> CHClCH <sub>2</sub> Cl	<b>CAS#:</b> 78-87-5	<b>RTECS#:</b> TX9625000	<b>IDLH:</b> Ca [400 ppm]
<b>Conversion:</b> 1 ppm = 4.62 mg/m <sup>3</sup>		<b>DOT:</b> 1279 130			
<b>Synonyms/Trade Names:</b> Dichloro-1,2-propane; 1,2-Dichloropropane					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL†:</b> TWA 75 ppm (350 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1013 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless liquid with a chloroform-like odor. [pesticide]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 113.0 <b>BP:</b> 206°F <b>Sol:</b> 0.3% <b>Fl.P:</b> 60°F <b>IP:</b> 10.87 eV <b>Sp.Gr:</b> 1.16 <b>VP:</b> 40 mmHg <b>FRZ:</b> -149°F <b>UEL:</b> 14.5% <b>LEL:</b> 3.4% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>✖:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, active metals					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; drow, dizz; liver, kidney damage; in animals: CNS depres; [carc] <b>TO:</b> Eyes, skin, resp sys, liver, kidneys, CNS [in animals: liver & mammary gland tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Propylene glycol dinitrate</b>		<b>Formula:</b> CH <sub>3</sub> CNO <sub>2</sub> OHCHNO <sub>2</sub> OH	<b>CAS#:</b> 6423-43-4	<b>RTECS#:</b> TY6300000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.79 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> PGDN; Propylene glycol-1,2-dinitrate; 1,2-Propylene glycol dinitrate					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 ppm (0.3 mg/m <sup>3</sup> ) [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a disagreeable odor. [Note: A solid below 18°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 166.1 BP: ? Sol: 0.1% F.L.P.: ? IP: ? Sp.Gr(77°F): 1.23 VP(72°F): 0.07 mmHg FRZ: 18°F UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Ammonia compounds, amines, oxidizers, reducing agents, combustible materials [Note: Similar to Ethylene glycol dinitrate in explosion potential.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes; conj; methemo; head, impaired balance, vis dist; in animals: liver, kidney damage TO: Eyes, CNS, blood, liver, kidneys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Propylene glycol monomethyl ether</b>		<b>Formula:</b> CH <sub>3</sub> OCH <sub>2</sub> CHCH <sub>3</sub>	<b>CAS#:</b> 107-98-2	<b>RTECS#:</b> UB7700000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.69 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dowtherm® 209, 1-Methoxy-2-hydroxypropane, 1-Methoxy-2-propanol, 2-Methoxy-1-methylethanol, Propylene glycol methyl ether					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (360 mg/m <sup>3</sup> ) ST 150 ppm (540 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 2554 OSHA 99	
<b>Physical Description:</b> Clear, colorless liquid with a mild, ethereal odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 90.1 BP: 248°F Sol: Miscible F.L.P.: 97°F IP: ? Sp.Gr: 0.96 VP(77°F): 12 mmHg FRZ: -139°F (Sets to glass) UEL(calc): 13.8% LEL(calc.): 1.6% Class IC Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, strong acids [Note: Hygroscopic (i.e., absorbs moisture from air). May slowly form reactive peroxides during prolonged storage.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; head, nau, dizz, drow, inco; vomit, diarr TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash Breath: Resp support Swallow: Medical attention immed		

<b>Propylene imine</b>	<b>Formula:</b> C <sub>3</sub> H <sub>7</sub> N	<b>CAS#:</b> 75-55-8	<b>RTECS#:</b> CM8050000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 2.34 mg/m <sup>3</sup>		<b>DOT:</b> 1921 131P (inhibited)		
<b>Synonyms/Trade Names:</b> 2-Methylaziridine, 2-Methylethyleneimine, Propyleneimine, Propylene imine (inhibited), Propylenimine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 2 ppm (5 mg/m <sup>3</sup> ) [skin] See Appendix A <b>OSHA PEL:</b> TWA 2 ppm (5 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless, oily liquid with an ammonia-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 57.1 BP: 152°F Sol: Miscible Fl.P: 25°F IP: 9.00 eV Sp.Gr: 0.80 VP: 112 mmHg FRZ: -85°F UEL: ? LEL: ? Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp,AsScba <b>Escape:</b> GmFS/ScbaE
<b>Incompatibilities and Reactivities:</b> Acids, strong oxidizers, water, carbonyl compounds, quinones, sulfonyl halides [ <b>Note:</b> Subject to violent polymerization in contact with acids. Hydrolyzes in water to form methylethanolamine.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Eye, skin burns; [carc] <b>TO:</b> Eyes, skin [in animals: nasal tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Propylene oxide</b>	<b>Formula:</b> C <sub>3</sub> H <sub>6</sub> O	<b>CAS#:</b> 75-56-9	<b>RTECS#:</b> TZ2975000	<b>IDLH:</b> Ca [400 ppm]
<b>Conversion:</b> 1 ppm = 2.38 mg/m <sup>3</sup>		<b>DOT:</b> 1280 127P		
<b>Synonyms/Trade Names:</b> 1,2-Epoxy propane; Methyl ethylene oxide; Methyloxirane; Propene oxide; 1,2-Propylene oxide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A <b>OSHA PEL†:</b> TWA 100 ppm (240 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 1612</b> <b>OSHA 88</b>	
<b>Physical Description:</b> Colorless liquid with a benzene-like odor. [ <b>Note:</b> A gas above 94°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 58.1 BP: 94°F Sol: 41% Fl.P: -35°F IP: 9.81 eV Sp.Gr: 0.83 VP: 445 mmHg FRZ: -170°F UEL: 36% LEL: 2.3% Class IA Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp,AsScba <b>Escape:</b> GmFS/ScbaE
<b>Incompatibilities and Reactivities:</b> Anhydrous metal chlorides; iron; strong acids, caustics & peroxides [ <b>Note:</b> Polymerization may occur due to high temperatures or contamination with alkalis, aqueous acids, amines & acidic alcohols.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; skin blisters, burns; [carc] <b>TO:</b> Eyes, skin, resp sys [in animals: nasal tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>n-Propyl nitrate</b>	<b>Formula:</b> CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> ONO <sub>2</sub>	<b>CAS#:</b> 627-13-4	<b>RTECS#:</b> UK0350000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 4.30 mg/m <sup>3</sup>	<b>DOT:</b> 1865 131			
<b>Synonyms/Trade Names:</b> Propyl ester of nitric acid				
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (105 mg/m <sup>3</sup> ) ST 40 ppm (170 mg/m <sup>3</sup> ) OSHA PEL†: TWA 25 ppm (110 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S227 (II-3) OSHA 7	
<b>Physical Description:</b> Colorless to straw-colored liquid with an ether-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 105.1 BP: 231°F Sol: Slight Fl.P: 68°F IP: 11.07 eV Sp.Gr: 1.07 VP: 18 mmHg FRZ: -148°F UEL: 100% LEL: 2% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>250 ppm:</b> Sa <b>500 ppm:</b> Sa:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS <sub>2</sub> /ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, combustible materials [Note: Forms explosive mixtures with combustible materials.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, skin; methemo, anoxia, cyan; dysp, lass, dizz, head TO: Eyes, skin, blood		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Pyrethrum</b>	<b>Formula:</b> C <sub>20</sub> H <sub>28</sub> O <sub>3</sub> /C <sub>21</sub> H <sub>28</sub> O <sub>3</sub> /C <sub>21</sub> H <sub>30</sub> O <sub>3</sub> / C <sub>22</sub> H <sub>30</sub> O <sub>3</sub> /C <sub>21</sub> H <sub>28</sub> O <sub>3</sub> /C <sub>22</sub> H <sub>28</sub> O <sub>3</sub>	<b>CAS#:</b> 8003-34-7	<b>RTECS#:</b> UR4200000	<b>IDLH:</b> 5000 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cinerin I or II, Jasmolin I or II, Pyrethrin I or II, Pyrethrum I or II [Note: Pyrethrum is a variable mixture of Cinerin, Jasmolin, and Pyrethrin.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5008 OSHA 70	
<b>Physical Description:</b> Brown, viscous oil or solid. [insecticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 316-374 BP: ? Sol: Insoluble Fl.P: 180-190°F IP: ? Sp.Gr: 1 (approx) VP: Low MLT: ? UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>50 mg/m<sup>3</sup>:</b> CcrOv95*/Sa* <b>125 mg/m<sup>3</sup>:</b> Sa:C*/PaprovHie* <b>250 mg/m<sup>3</sup>:</b> CcrFOv100/PaprovHie*/ ScbaF/SaF <b>5000 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Erythema, derm, papules, pruritus, rhin; sneez; asthma TO: Resp sys, skin, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Pyridine</b>		<b>Formula:</b> C <sub>5</sub> H <sub>5</sub> N	<b>CAS#:</b> 110-86-1	<b>RTECS#:</b> UR8400000	<b>IDLH:</b> 1000 ppm
<b>Conversion:</b> 1 ppm = 3.24 mg/m <sup>3</sup>		<b>DOT:</b> 1282 129			
<b>Synonyms/Trade Names:</b> Azabenzene, Azine					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (15 mg/m <sup>3</sup> ) OSHA PEL: TWA 5 ppm (15 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1613 OSHA 7	
<b>Physical Description:</b> Colorless to yellow liquid with a nauseating, fish-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 79.1 BP: 240°F Sol: Miscible F.P.: 68°F IP: 9.27 eV Sp.Gr: 0.98 VP: 16 mmHg FRZ: -44°F UEL: 12.4% LEL: 1.8% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>125 ppm:</b> Sa:Cf£/PapOv£/ 50 ppm: CcrFOv/GmFOv/PapTov£/ ScaB/SaF <b>1000 ppm:</b> SaF:Pd,Pp §: ScaB:F:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv/ScaB£		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes; head, anxi, dizz, insom; nau, anor; derm; liver, kidney damage TO: Eyes, skin, CNS, liver, kidneys, GI tract,			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Quinone</b>		<b>Formula:</b> OC <sub>6</sub> H <sub>4</sub> O	<b>CAS#:</b> 106-51-4	<b>RTECS#:</b> DK2625000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 4.42 mg/m <sup>3</sup>		<b>DOT:</b> 2587 153			
<b>Synonyms/Trade Names:</b> 1,4-Benzoquinone; p-Benzoquinone; 1,4-Cyclohexadiene dioxide; p-Quinone					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.4 mg/m <sup>3</sup> (0.1 ppm) OSHA PEL: TWA 0.4 mg/m <sup>3</sup> (0.1 ppm)				<b>Measurement Methods</b> (see Table 1): NIOSH S181 (II-4)	
<b>Physical Description:</b> Pale-yellow solid with an acrid, chlorine-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 108.1 BP: Sublimes Sol: Slight F.P.: 100-200°F IP: 9.68 eV Sp.Gr: 1.32 VP(77°F): 0.1 mmHg MLT: 240°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10 mg/m<sup>3</sup>:</b> Sa:Cf£ <b>20 mg/m<sup>3</sup>:</b> ScaB/SaF <b>100 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScaB:F:Pd,Pp/SaF:Pd,Pp:AScBa <b>Escape:</b> GmFOv100/ScaB£		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Eye irrit, conj; kera; skin irrit TO: Eyes, skin			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Resorcinol</b>	<b>Formula:</b> C <sub>6</sub> H <sub>4</sub> (OH) <sub>2</sub>	<b>CAS#:</b> 108-46-3	<b>RTECS#:</b> VG9625000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.50 mg/m <sup>3</sup>	<b>DOT:</b> 2876 153			
<b>Synonyms/Trade Names:</b> 1,3-Benzenediol; m-Benzenediol; 1,3-Dihydroxybenzene; m-Dihydroxybenzene; 3-Hydroxyphenol; m-Hydroxyphenol				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 ppm (45 mg/m <sup>3</sup> ) ST 20 ppm (90 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 5701 <b>OSHA</b> PV2053	
<b>Physical Description:</b> White needles, plates, crystals, flakes, or powder with a faint odor. [ <b>Note:</b> Turns pink on exposure to air or light, or contact with iron.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 110.1 <b>BP:</b> 531°F <b>Sol:</b> 110% <b>Fl.P:</b> 261°F <b>IP:</b> 8.63 eV <b>Sp.Gr:</b> 1.27 <b>VP(77°F):</b> 0.0002 mmHg <b>MLT:</b> 228°F <b>UEL:</b> ? <b>LEL(392°F):</b> 1.4% Class IIIB Combustible Liquid, but may be difficult to ignite.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
		<b>Incompatibilities and Reactivities:</b> Acetanilide, albumin, alkalis, antipyrine, camphor, ferric salts, menthol, spirit nitrous ether, strong oxidizers & bases [ <b>Note:</b> Hygroscopic (i.e., absorbs moisture from the air).]		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat, upper resp sys; methemo; cyan, convuls; restless, bluish skin, incr heart rate, dysp; dizz, drow, hypothermia, hema; spleen, kidney, liver changes; derm <b>TO:</b> Eyes, skin, resp sys, CVS, CNS, blood, spleen, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Rhodium (metal fume and insoluble compounds, as Rh)</b>	<b>Formula:</b> Rh (metal)	<b>CAS#:</b> 7440-16-6 (metal)	<b>RTECS#:</b> V19069000	<b>IDLH:</b> 100 mg/m <sup>3</sup> (as Rh)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> <b>Rhodium metal:</b> Elemental rhodium Synonyms of other insoluble rhodium compounds vary depending upon the specific compound.				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> <b>OSHA PEL:</b> TWA 0.1 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> S188 (II-3)	
<b>Physical Description:</b> Metal: White, hard, ductile, malleable solid with a bluish-gray luster.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 102.9 <b>BP:</b> 6741°F <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 12.41 (metal) <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 3571°F <b>UEL:</b> NA <b>LEL:</b> NA Metal: Noncombustible Solid in bulk form, but flammable as dust or powder.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.5 mg/m<sup>3</sup>:</b> Qm <b>1 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>2.5 mg/m<sup>3</sup>:</b> Sa:Cf/PaprHie <b>5 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/SaF/SaF <b>100 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Chlorine trifluoride, oxygen difluoride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh <b>SY:</b> Possible resp sens <b>TO:</b> Resp sys			<b>First Aid (see Table 6):</b> <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Rhodium (soluble compounds, as Rh)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 2 mg/m <sup>3</sup> (as Rh)
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific soluble rhodium compound.					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.001 mg/m <sup>3</sup> OSHA PEL: TWA 0.001 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH S189 (II-3)	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble rhodium compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble rhodium compound.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.01 mg/m<sup>3</sup>:</b> 100XQ*/Sa* <b>0.025 mg/m<sup>3</sup>:</b> Sa:Cf*/PaprHie* <b>0.05 mg/m<sup>3</sup>:</b> 100F/PaprTHie*/ScbaF/SaF <b>2 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> In animals: irrit eyes; CNS damage <b>TO:</b> Eyes, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Ronnel</b>		<b>Formula:</b> (CH <sub>3</sub> O) <sub>2</sub> P(S)OC <sub>6</sub> H <sub>2</sub> Cl <sub>3</sub>	<b>CAS#:</b> 299-84-3	<b>RTECS#:</b> TG0525000	<b>IDLH:</b> 300 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> O,O-Dimethyl O-(2,4,5-trichlorophenyl) phosphorothioate; Fenchlorophos					
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL†: TWA 15 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 5600 OSHA PV2054	
<b>Physical Description:</b> White to light-tan, crystalline solid. [insecticide] [Note: A liquid above 106°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 321.6 BP: Decomposes Sol(77°F): 0.004% Fl.P: NA IP: ? Sp.Gr(77°F): 1.49 VP(77°F): 0.0008 mmHg MLT: 106°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>100 mg/m<sup>3</sup>:</b> CcrOv95/Sa <b>250 mg/m<sup>3</sup>:</b> Sa:Cf/PaprovHie <b>300 mg/m<sup>3</sup>:</b> CcrFOv100/GmFOv100/ PaprtOvHie*/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> In animals: irrit eyes; chol inhibition; liver, kidney damage <b>TO:</b> Eyes, liver, kidneys, blood plasma			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Rosin core solder, pyrolysis products (as formaldehyde)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Rosin flux pyrolysis products, Rosin core soldering flux pyrolysis products					
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.1 mg/m <sup>3</sup> [*Note: "Ca" in the presence of formaldehyde, acetaldehyde, or malonaldehyde. See Appendices A & C (Aldehydes).]				<b>Measurement Methods (see Table 1):</b> NIOSH 2541, 3500	
<b>OSHA PEL†:</b> none					
<b>Physical Description:</b> Pyrolysis products of rosin core solder include acetone, aliphatic aldehydes, methyl alcohol, methane, ethane, various abietic acids (the major components of rosin), CO & CO <sub>2</sub> .					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific rosin core solder being used.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.  <b>In the presence of Formaldehyde, Acetaldehyde, or Malonaldehyde:</b> NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Varies					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh <b>SY:</b> Irrit eyes, nose, throat, upper resp sys [carc (in the presence of Formaldehyde, Acetaldehyde, or Malonaldehyde)] <b>TO:</b> Eyes, resp sys [nasal cancer; thyroid gland tumors in animals (in the presence of Formaldehyde, Acetaldehyde, or Malonaldehyde)]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Resp support	

<b>Rotenone</b>		<b>Formula:</b> C <sub>23</sub> H <sub>22</sub> O <sub>6</sub>	<b>CAS#:</b> 83-79-4	<b>RTECS#:</b> DJ2800000	<b>IDLH:</b> 2500 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2,12,12a-Tetrahydro-8,9-dimethoxy-2-(1-methylethenyl)-[1]benzopyrano[3,4-b]furo[2,3-h][1]benzopyran-6(6aH)-one					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 5007	
<b>Physical Description:</b> Colorless to red, odorless, crystalline solid. [insecticide]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 394.4 <b>BP:</b> Decomposes <b>Sol:</b> Insoluble <b>Fl.P.?</b> <b>IP:</b> ? <b>Sp.Gr:</b> 1.27 <b>VP:</b> <0.00004 mmHg <b>MLT:</b> 330°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>5 mg/m<sup>3</sup>:</b> CrOv95/Sa <b>125 mg/m<sup>3</sup>:</b> Sa:Cf/PaprovHie <b>250 mg/m<sup>3</sup>:</b> CrFOv100/GmFOv100/PaprovHie/SaT:Cf/ScbaF/SaF <b>2500 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; numb muc memb; nau, vomit, abdom pain; musc tremor, inco, clonic convuls, stupor <b>TO:</b> Eyes, skin, resp sys, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Rouge</b>	<b>Formula:</b> Fe <sub>2</sub> O <sub>3</sub>	<b>CAS#:</b> 1309-37-1	<b>RTECS#:</b> NO7400000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Iron(III)oxide, Iron oxide red, Red iron oxide, Red oxide				
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> A fine, red powder of ferric oxide. [Note: Usually used in cake form or impregnated in paper or cloth.]				
<b>Chemical &amp; Physical Properties:</b> MW: 159.7 BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 5.24 VP: 0 mmHg (approx) MLT: 2849°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Calcium hypochlorite, carbon monoxide, hydrogen peroxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air	

<b>Selenium</b>	<b>Formula:</b> Se	<b>CAS#:</b> 7782-49-2	<b>RTECS#:</b> VS7700000	<b>IDLH:</b> 1 mg/m <sup>3</sup> (as Se)
<b>Conversion:</b>		<b>DOT:</b> 2658 152 (powder)		
<b>Synonyms/Trade Names:</b> Elemental selenium, Selenium alloy				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.2 mg/m <sup>3</sup> OSHA PEL*: TWA 0.2 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other selenium compounds (as Se) except Selenium hexafluoride.]			<b>Measurement Methods</b> (see Table 1): NIOSH 7300, 7301, 7303, 9102, S190 (II-7) OSHA ID121	
<b>Physical Description:</b> Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.]				
<b>Chemical &amp; Physical Properties:</b> MW: 79.0 BP: 1265°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 4.28 VP: 0 mmHg (approx) MLT: 392°F UEL: NA LEL: NA Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 1 mg/m <sup>3</sup> : Qm*/95XQ*/100F/Pap/Hie*/ Pap/Hie*/Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Acids, strong oxidizers, chromium trioxide, potassium bromate, cadmium				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; vis dist; head; chills, fever; dysp, bron; metallic taste, garlic breath, GI dist; dermat; eye, skin burns; in animals: anemia; liver nec, cirr; kidney, spleen damage TO: Eyes, skin, resp sys, liver, kidneys, blood, spleen			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Selenium hexafluoride</b>	<b>Formula:</b> SeF <sub>6</sub>	<b>CAS#:</b> 7783-79-1	<b>RTECS#:</b> VS9450000	<b>IDLH:</b> 2 ppm
<b>Conversion:</b> 1 ppm = 7.89 mg/m <sup>3</sup>	<b>DOT:</b> 2194 125			
<b>Synonyms/Trade Names:</b> Selenium fluoride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 ppm OSHA PEL: TWA 0.05 ppm (0.4 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas.				
<b>Chemical &amp; Physical Properties:</b> MW: 193.0 BP: -30°F Sol: Insoluble F.L.P: NA IP: ? RGasD: 6.66 VP: >1 atm FRZ: -59°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 0.5 ppm: Sa 1.25 ppm: Sa:Cf 2 ppm: Sa:T:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water [Note: Hydrolyzes very slowly in cold water.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh SY: In animals: pulm irrit, edema TO: Resp sys			<b>First Aid</b> (see Table 6): Breath: Resp support	

<b>Silica, amorphous</b>	<b>Formula:</b> SiO <sub>2</sub>	<b>CAS#:</b> 7631-86-9	<b>RTECS#:</b> VV7310000	<b>IDLH:</b> 3000 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Diatomaceous earth, Diatomaceous silica, Diatomite, Precipitated amorphous silica, Silica gel, Silicon dioxide (amorphous)				
<b>Exposure Limits:</b> NIOSH REL: TWA 6 mg/m <sup>3</sup> OSHA PEL†: TWA 20 mppcf [(80 mg/m <sup>3</sup> )/%SiO <sub>2</sub> ]			<b>Measurement Methods</b> (see Table 1): NIOSH 7501	
<b>Physical Description:</b> Transparent to gray, odorless powder. [Note: Amorphous silica is the non-crystalline form of SiO <sub>2</sub> .]				
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 4046°F Sol: Insoluble F.L.P: NA IP: NA Sp.Gr: 2.20 VP: 0 mmHg (approx) MLT: 3110°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 30 mg/m <sup>3</sup> : Qm 60 mg/m <sup>3</sup> : 95XQ/Sa 150 mg/m <sup>3</sup> : Sa:Cf/PaprHie 300 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 3000 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Fluorine, oxygen difluoride, chlorine trifluoride				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Irrit eyes, pneumoconiosis TO: Eyes, resp sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Breath: Fresh air	

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<b>Silica, crystalline (as respirable dust)</b>	<b>Formula:</b> SiO <sub>2</sub>	<b>CAS#:</b> 14808-60-7	<b>RTECS#:</b> VV7330000	<b>IDLH:</b> Ca [25 mg/m <sup>3</sup> (cristobalite, tridymite); 50 mg/m <sup>3</sup> (quartz, tripoli)]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cristobalite, Quartz, Tridymite, Tripoli				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 0.05 mg/m <sup>3</sup> See Appendix A <b>OSHA PEL:</b> See Appendix C (Mineral Dusts)			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7500, 7601, 7602 <b>OSHA</b> ID142	
<b>Physical Description:</b> Colorless, odorless solid. [Note: A component of many mineral dusts.]				
<b>Chemical &amp; Physical Properties:</b> MW: 60.1 BP: 4046°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 2.66 VP: 0 mmHg (approx) MLT: 3110°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>0.5 mg/m<sup>3</sup>:</b> 95XQ <b>1.25 mg/m<sup>3</sup>:</b> PaprHie/Sa:Cf <b>2.5 mg/m<sup>3</sup>:</b> 100F/PaprTHie <b>25 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Powerful oxidizers: fluorine, chlorine trifluoride, manganese trioxide, oxygen difluoride, hydrogen peroxide, etc.; acetylene; ammonia			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Cough, dysp, wheez; decr pulm func, progressive resp symptoms (silicosis); irrit eyes; [carc] <b>TO:</b> Eyes, resp sys [in animals: lung cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Silicon</b>	<b>Formula:</b> Si	<b>CAS#:</b> 7440-21-3	<b>RTECS#:</b> VW0400000	<b>IDLH:</b> N.D.	
<b>Conversion:</b>	<b>DOT:</b> 1346 170 (amorphous powder)				
<b>Synonyms/Trade Names:</b> Elemental silicon [Note: Does not occur free in nature, but is found in silicon dioxide (silica) & in various silicates.]					
<b>S</b>	<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL†:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 0500, 0600	
	<b>Physical Description:</b> Black to gray, lustrous, needle-like crystals. [Note: The amorphous form is a dark-brown powder.]				
<b>Chemical &amp; Physical Properties:</b> MW: 28.1 BP: 4271°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr(77°F): 2.33 VP: 0 mmHg (approx) MLT: 2570°F UEL: NA LEL: NA MEC: 160 g/m <sup>3</sup> Combustible Solid in powder form.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Chlorine, fluorine, oxidizers, calcium, cesium carbide, alkaline carbonates					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; cough <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Silicon carbide</b>	<b>Formula:</b> SiC	<b>CAS#:</b> 409-21-2	<b>RTECS#:</b> VV0450000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Carbon silicide, Carborundum®, Silicon monocarbide				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> Yellow to green to bluish-black, iridescent crystals.				
<b>Chemical &amp; Physical Properties:</b> MW: 40.1 BP: Sublimes Sol: Insoluble Fl.P: NA IP: 9.30 eV Sp.Gr: 3.23 VP: 0 mmHg (approx) MLT: 4892°F (Sublimes) UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> None reported [Note: Sublimes with decomposition at 4892°F.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; cough TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air Swallow: Medical attention immed	

<b>Silicon tetrahydride</b>	<b>Formula:</b> SiH <sub>4</sub>	<b>CAS#:</b> 7803-62-5	<b>RTECS#:</b> VV1400000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 1.31 mg/m <sup>3</sup>	<b>DOT:</b> 2203 116			
<b>Synonyms/Trade Names:</b> Monosilane, Silane, Silicane				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (7 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a repulsive odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 32.1 BP: -169°F Sol: Decomposes Fl.P: NA (Gas) IP: ? RGasD: 1.11 VP: >1 atm FRZ: -301°F UEL: ? LEL: ? Flammable Gas (may ignite SPONTANEOUSLY in air).		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Halogens (bromine, chlorine, carbonyl chloride, antimony pentachloride, tin(IV) chloride), water				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Irrit eyes, skin, muc memb; nau, head TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Breath: Resp support	

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<b>Silver (metal dust and soluble compounds, as Ag)</b>		<b>Formula:</b> Ag (metal)	<b>CAS#:</b> 7440-22-4 (metal)	<b>RTECS#:</b> VW3500000 (metal)	<b>IDLH:</b> 10 mg/m <sup>3</sup> (as Ag)
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Silver metal; Argentum Synonyms of soluble silver compounds such as Silver nitrate (AgNO <sub>3</sub> ) vary depending upon the specific compound.					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.01 mg/m <sup>3</sup> OSHA PEL: TWA 0.01 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 9102 OSHA ID121	
<b>Physical Description:</b> Metal: White, lustrous solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 107.9 BP: 3632°F Sol: Insoluble F.L.P.: NA IP: NA Sp.Gr: 10.49 (metal) VP: 0 mmHg (approx) MLT: 1761°F UEL: NA LEL: NA Metal: Noncombustible Solid, but flammable in form of dust or powder.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam (AgNO <sub>3</sub> ) <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.25 mg/m<sup>3</sup>:</b> Sa:Cf/PapriHieE <b>0.5 mg/m<sup>3</sup>:</b> 100F/ScbaF/SaF <b>10 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, tartaric acid					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Blue-gray eyes, nasal septum, throat, skin; irrit, ulceration skin; GI dist TO: Nasal septum, skin, eyes			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Soapstone (containing less than 1% quartz)</b>		<b>Formula:</b> 3MgO·4SiO <sub>2</sub> ·H <sub>2</sub> O	<b>CAS#:</b>	<b>RTECS#:</b> VV8780000	<b>IDLH:</b> 3000 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Massive talc, Soapstone silicate, Steatite					
<b>Exposure Limits:</b> NIOSH REL: TWA 6 mg/m <sup>3</sup> (total) TWA 3 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 20 mppcf				<b>Measurement Methods (see Table 1):</b> NIOSH 0500	
<b>Physical Description:</b> Odorless, white-gray powder.					
<b>Chemical &amp; Physical Properties:</b> MW: 379.3 BP: ? Sol: Insoluble F.L.P.: NA IP: NA Sp.Gr: 2.7-2.8 VP: 0 mmHg (approx) MLT: ? UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>30 mg/m<sup>3</sup>:</b> Qm <b>60 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>150 mg/m<sup>3</sup>:</b> PapriHie <b>300 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PapriHie*/ScbaF/SaF <b>3000 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Pneumoconiosis: cough, dysp; digital clubbing; cyan; basal crackles, cor pulmonale TO: Resp sys, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Resp support		

<b>Sodium aluminum fluoride (as F)</b>		<b>Formula:</b> Na <sub>3</sub> AlF <sub>6</sub>	<b>CAS#:</b> 15096-52-3	<b>RTECS#:</b> WA9625000	<b>IDLH:</b> 250 mg/m <sup>3</sup> (as F)
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Cryocide, Cryodust, Cryolite, Sodium hexafluoroaluminate					
<b>Exposure Limits:</b> NIOSH REL*: TWA 2.5 mg/m <sup>3</sup> OSHA PEL*: TWA 2.5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other inorganic, solid fluorides (as F).]				<b>Measurement Methods</b> (see Table 1): NIOSH 7902 OSHA ID110	
<b>Physical Description:</b> Colorless to dark odorless solid. [pesticide] [Note: Loses color on heating.]					
<b>Chemical &amp; Physical Properties:</b> MW: 209.9 BP: Decomposes Sol: 0.04% Fl.P: NA IP: NA Sp.Gr: 2.90 VP: 0 mmHg (approx) MLT: 1832°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> 12.5 mg/m <sup>3</sup> : Qm 25 mg/m <sup>3</sup> : 95XQ*/Sa* 62.5 mg/m <sup>3</sup> : Sa:C*/PaprHie*+ 125 mg/m <sup>3</sup> : 100F*/ScbaF/SaF 250 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F*/ScbaE  +Note: May need acid gas sorbent	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, resp sys; nau, abdom pain, diarr; salv, thirst, sweat; stiff spine; dermat; calcification of ligaments of ribs, pelvis TO: Eyes, skin, resp sys, CNS, skeleton, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Sodium azide</b>		<b>Formula:</b> NaN <sub>3</sub>	<b>CAS#:</b> 26628-22-8	<b>RTECS#:</b> VY8050000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1687 153			
<b>Synonyms/Trade Names:</b> Azide, Azium, Sodium salt of hydrazoic acid					
<b>Exposure Limits:</b> NIOSH REL: C 0.1 ppm (as HN <sub>3</sub> ) [skin] C 0.3 mg/m <sup>3</sup> (as NaN <sub>3</sub> ) [skin] OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA ID121, ID211	
<b>Physical Description:</b> Colorless to white, odorless, crystalline solid. [pesticide] [Note: Forms hydrazoic acid (HN <sub>3</sub> ) in water.]					
<b>Chemical &amp; Physical Properties:</b> MW: 65.0 BP: Decomposes Sol(63°F): 42% Fl.P: ? IP: 11.70 eV Sp.Gr: 1.85 VP: ? MLT: 527°F (Decomposes) UEL: ? LEL: ? Combustible Solid (if heated above 572°F).		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Acids, metals, water [Note: Over a period of time, sodium azide may react with copper, lead, brass, or solder in plumbing systems to form an accumulation of the HIGHLY EXPLOSIVE compounds of lead azide & copper azide.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; head, dizz, lass, blurred vision; low BP, bradycardia; kidney changes TO: Eyes, skin, CNS, CVS, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

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<b>Sodium bisulfite</b>	<b>Formula:</b> NaHSO <sub>3</sub>	<b>CAS#:</b> 7631-90-5	<b>RTECS#:</b> VZ2000000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b> 2693 154 (solution)			
<b>Synonyms/Trade Names:</b> Monosodium salt of sulfurous acid, Sodium acid bisulfite, Sodium bisulphite, Sodium hydrogen sulfite				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> White crystals or powder with a slight odor of sulfur dioxide.				
<b>Chemical &amp; Physical Properties:</b> MW: 104.1 BP: Decomposes Sol: 29% F.P: NA IP: NA Sp.Gr: 1.48 VP: ? MLT: Decomposes UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Heat (decomposes) [Note: Slowly oxidized to the sulfate on exposure to air.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Breath: Fresh air Swallow: Medical attention immed	

<b>Sodium cyanide (as CN)</b>	<b>Formula:</b> NaCN	<b>CAS#:</b> 143-33-9	<b>RTECS#:</b> VZ7525000	<b>IDLH:</b> 25 mg/m <sup>3</sup> (as CN)
<b>Conversion:</b>	<b>DOT:</b> 1689 157 (solid); 3414 157 (solution)			
<b>Synonyms/Trade Names:</b> Sodium salt of hydrocyanic acid				
<b>Exposure Limits:</b> NIOSH REL*: C 5 mg/m <sup>3</sup> (4.7 ppm) [10-minute] OSHA PEL*: TWA 5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other cyanides (as CN) except Hydrogen cyanide.]			<b>Measurement Methods</b> (see Table 1): NIOSH 6010, 7904	
<b>Physical Description:</b> White, granular or crystalline solid with a faint, almond-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 49.0 BP: 2725°F Sol(77°F): 58% F.P: NA IP: NA Sp.Gr: 1.60 VP: 0 mmHg (approx) MLT: 1047°F UEL: NA LEL: NA Noncombustible Solid, but contact with acids releases highly flammable hydrogen cyanide.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 25 mg/m <sup>3</sup> : Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS100/ScbaE
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (such as acids, acid salts, chlorates & nitrates) [Note: Absorbs moisture from the air forming a syrup.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; asphy; lass, head, conf; nau, vomit; incr resp rate; slow gasping respiration; thyroid, blood changes TO: Eyes, skin, CVS, CNS, thyroid, blood			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Sodium fluoride (as F)</b>	<b>Formula:</b> NaF	<b>CAS#:</b> 7681-49-4	<b>RTECS#:</b> WB0350000	<b>IDLH:</b> 250 mg/m <sup>3</sup> (as F)
<b>Conversion:</b>	<b>DOT:</b> 1690 154			
<b>Synonyms/Trade Names:</b> Floridine, Sodium monofluoride				
<b>Exposure Limits:</b> NIOSH REL*: TWA 2.5 mg/m <sup>3</sup> OSHA PEL*: TWA 2.5 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other inorganic, solid fluorides (as F).]			<b>Measurement Methods</b> (see Table 1): NIOSH 7902, 7906 OSHA ID110	
<b>Physical Description:</b> Odorless, white powder or colorless crystals. [Note: Pesticide grade is often dyed blue.]				
<b>Chemical &amp; Physical Properties:</b> MW: 42.0 BP: 3099°F Sol: 4% Fl.P: NA IP: NA Sp.Gr: 2.78 VP: 0 mmHg (approx) MLT: 1819°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>12.5 mg/m<sup>3</sup>:</b> Qm <b>25 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>62.5 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie*+ <b>125 mg/m<sup>3</sup>:</b> 100F+/ScbaF/SaF <b>250 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F+/ScbaE  +Note: May need acid gas sorbent	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, resp sys; nau, abdom pain, diarr; salv, thirst, sweat; stiff spine; dermat; calcification of ligaments of ribs, pelvis TO: Eyes, skin, resp sys, CNS, skeleton, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed	

<b>Sodium fluoroacetate</b>	<b>Formula:</b> FCH <sub>2</sub> COONa	<b>CAS#:</b> 62-74-8	<b>RTECS#:</b> AH9100000	<b>IDLH:</b> 2.5 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2629 151			
<b>Synonyms/Trade Names:</b> SFA, Sodium monofluoroacetate				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 mg/m <sup>3</sup> ST 0.15 mg/m <sup>3</sup> [skin] OSHA PEL†: TWA 0.05 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH S301 (II-5)	
<b>Physical Description:</b> Fluffy, colorless to white (sometimes dyed black), odorless powder. [Note: A liquid above 95°F.] [rodenticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 100.0 BP: Decomposes Sol: Miscible Fl.P: NA IP: ? Sp.Gr: ? VP: Low MLT: 392°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.25 mg/m<sup>3</sup>:</b> Qm <b>0.5 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>1.25 mg/m<sup>3</sup>:</b> Sa:Cf/PapHie <b>2.5 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Vomit; anxi, auditory halu; facial pares; twitch face musc; pulsus alternans, ectopic heartbeat, tacar, card arrhy; pulm edema; nystagmus; convuls; liver, kidney damage TO: Resp sys, CVS, liver, kidneys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Sodium hydroxide</b>	<b>Formula:</b> NaOH	<b>CAS#:</b> 1310-73-2	<b>RTECS#:</b> WB4900000	<b>IDLH:</b> 10 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1823 154 (dry, solid); 1824 154 (solution)			
<b>Synonyms/Trade Names:</b> Caustic soda, Lye, Soda lye, Sodium hydrate				
<b>Exposure Limits:</b> NIOSH REL: C 2 mg/m <sup>3</sup> OSHA PEL†: TWA 2 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 7401	
<b>Physical Description:</b> Colorless to white, odorless solid (flakes, beads, granular form).				
<b>Chemical &amp; Physical Properties:</b> MW: 40.0 BP: 2534°F Sol: 111% F.I.P: NA IP: NA Sp.Gr: 2.13 VP: 0 mmHg (approx) MLT: 605°F UEL: NA LEL: NA Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10 mg/m<sup>3</sup>:</b> Sa:CfE/100F/Pap/HieL/ScaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water; acids; flammable liquids; organic halogens; metals such as aluminum, tin & zinc; nitromethane [Note: Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb; pneu; eye, skin burns; temporary loss of hair <b>TO:</b> Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Sodium metabisulfite</b>	<b>Formula:</b> Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub>	<b>CAS#:</b> 7681-57-4	<b>RTECS#:</b> UX8225000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Disodium pyrosulfite, Sodium metabisulphite, Sodium pyrosulfite				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> White to yellowish crystals or powder with an odor of sulfur dioxide.				
<b>Chemical &amp; Physical Properties:</b> MW: 190.1 BP: Decomposes Sol: 54% F.I.P: NA IP: NA Sp.Gr: 1.4 VP: ? MLT: >302°F (Decomposes) UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> Heat (decomposes) [Note: Slowly oxidized to the sulfate on exposure to air & moisture.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, muc memb <b>TO:</b> Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed	

<b>Starch</b>	<b>Formula:</b> (C <sub>6</sub> H <sub>10</sub> O <sub>5</sub> ) <sub>n</sub>	<b>CAS#:</b> 9005-25-8	<b>RTECS#:</b> GM5090000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Corn starch, Rice starch, Sorghum gum, α-Starch, Starch gum, Tapioca starch				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> Fine, white, odorless powder. [Note: A carbohydrate polymer composed of 25% amylose & 75% amylopectin.]				
<b>Chemical &amp; Physical Properties:</b> MW: varies BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 1.45 VP: 0 mmHg (approx) MLT: Decomposes UEL: NA LEL: NA MEC: 50 g/m <sup>3</sup> Noncombustible Solid, but may form explosive mixture with air.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids, iodine, alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; cough, chest pain; dermat; rhin TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Stibine</b>	<b>Formula:</b> SbH <sub>3</sub>	<b>CAS#:</b> 7803-52-3	<b>RTECS#:</b> WJ0700000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 5.10 mg/m <sup>3</sup>	<b>DOT:</b> 2676 119			
<b>Synonyms/Trade Names:</b> Antimony hydride, Antimony trihydride, Hydrogen antimonide				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 ppm (0.5 mg/m <sup>3</sup> ) OSHA PEL: TWA 0.1 ppm (0.5 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 6008	
<b>Physical Description:</b> Colorless gas with a disagreeable odor like hydrogen sulfide.				
<b>Chemical &amp; Physical Properties:</b> MW: 124.8 BP: -1°F Sol: Slight Fl.P: NA (Gas) IP: 9.51 eV R <sub>Gas</sub> D: 4.31 VP: >1 atm FRZ: -126°F UEL: ? LEL: ? Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>1 ppm:</b> Sa <b>2.5 ppm:</b> Sa:Cf <b>5 ppm:</b> SaT:Cf/ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Acids, halogenated hydrocarbons, oxidizers, moisture, chlorine, ozone, ammonia				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Head, lass; nau, abdom pain; lumbar pain, hema, hemolytic anemia; jaun; pulm irrit TO: Blood, liver, kidneys, resp sys		<b>First Aid (see Table 6):</b> <b>Breath:</b> Resp support		

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<b>Stoddard solvent</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b>
		8052-41-3	WJ8925000	20,000 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1268 128 (petroleum distillates, n.o.s.)			
<b>Synonyms/Trade Names:</b> Dry cleaning safety solvent, Mineral spirits, Petroleum solvent, Spotting naphtha [Note: A refined petroleum solvent with a flash point of 102-110°F, boiling point of 309-396°F, and containing >65% C <sub>10</sub> or higher hydrocarbons.]				
<b>Exposure Limits:</b> NIOSH REL: TWA 350 mg/m <sup>3</sup> C 1800 mg/m <sup>3</sup> [15-minute] OSHA PEL†: TWA 500 ppm (2900 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 1550	
<b>Physical Description:</b> Colorless liquid with a kerosene-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: Varies BP: 309-396°F Sol: Insoluble F.L.P.: 102-110°F IP: ? Sp.Gr: 0.78 VP: ? FRZ: ? UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>3500 mg/m<sup>3</sup>:</b> CcrOv*/Sa* <b>8750 mg/m<sup>3</sup>:</b> Sa:Cf*/PaprvOv* <b>17,500 mg/m<sup>3</sup>:</b> CcrFOv/GmFOv/PaprvTOv*/ScbaF/SaF <b>20,000 mg/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, nose, throat; dizz; dermat; chemical pneu (aspir liquid); in animals: kidney damage <b>TO:</b> Eyes, skin, resp sys, CNS, kidneys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Strychnine</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b>
	C <sub>21</sub> H <sub>22</sub> N <sub>2</sub> O <sub>2</sub>	57-24-9	WL2275000	3 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1692 151			
<b>Synonyms/Trade Names:</b> Nux vomica, Strychnos				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.15 mg/m <sup>3</sup> OSHA PEL: TWA 0.15 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 5016	
<b>Physical Description:</b> Colorless to white, odorless, crystalline solid. [pesticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 334.4 BP: Decomposes Sol: 0.02% F.L.P.: ? IP: ? Sp.Gr: 1.36 VP: Low MLT: 514°F UEL: ? LEL: ? Combustible Solid, but difficult to ignite.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam <b>Remove:</b> N.R. <b>Change:</b> Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>0.75 mg/m<sup>3</sup>:</b> Qm <b>1.5 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>3 mg/m<sup>3</sup>:</b> Sa:Cf/PaprvHie/100F/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Stiff neck, facial musc; restless, anxi, incr acuity of perception; incr reflex excitability; cyan; tetanic convuls with opisthotonos <b>TO:</b> CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Styrene</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> CH=CH <sub>2</sub>	<b>CAS#:</b> 100-42-5	<b>RTECS#:</b> WL3675000	<b>IDLH:</b> 700 ppm
<b>Conversion:</b> 1 ppm = 4.26 mg/m <sup>3</sup>		<b>DOT:</b> 2055 128P (inhibited)		
<b>Synonyms/Trade Names:</b> Ethenyl benzene, Phenylethylene, Styrene monomer, Styrol, Vinyl benzene				
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (215 mg/m <sup>3</sup> ) ST 100 ppm (425 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm C 200 ppm 600 ppm (5-minute maximum peak in any 3 hours)			<b>Measurement Methods (see Table 1):</b> NIOSH 1501, 3800 OSHA 9, 89	
<b>Physical Description:</b> Colorless to yellow, oily liquid with a sweet, floral odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 104.2 BP: 293°F Sol: 0.03% F.L.P: 88°F IP: 8.40 eV Sp.Gr: 0.91 VP: 5 mmHg FRZ: -23°F UEL: 6.8% LEL: 0.9% Class IC Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>500 ppm:</b> CcrOv*/Sa* <b>700 ppm:</b> Sa:Cf*/CcrFOv/GmFOv/ Paprv*/ScbaF/SaF <b>§:</b> ScbaF: Pd,Pp/SaF: Pd,Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, catalysts for vinyl polymers, peroxides, strong acids, aluminum chloride [Note: May polymerize if contaminated or subjected to heat. Usually contains an inhibitor such as tert-butylcatechol.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose, resp sys; head, lass, dizz, conf, mal, drow, unsteady gait; narco; defatting derm; possible liver inj; repro effects TO: Eyes, skin, resp sys, CNS, liver, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Subtilisin</b>	<b>Formula:</b>	<b>CAS#:</b> 1395-21-7 (BPN) 9014-01-1 (Carlsburg)	<b>RTECS#:</b> CO9450000 (BPN) CO9550000 (Carlsburg)	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Bacillus subtilis, Bacillus subtilis BPN, Bacillus subtilis Carlsburg, Proteolytic enzymes, Subtilisin BPN, Subtilisin Carlsburg [Note: Commercial proteolytic enzymes are used in laundry detergents.]				
<b>Exposure Limits:</b> NIOSH REL: ST 0.00006 mg/m <sup>3</sup> [60-minute] OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Light-colored, free-flowing powders. [Note: A protein containing numerous amino acids.]				
<b>Chemical &amp; Physical Properties:</b> MW: 28,000 (approx) BP: ? Sol: ? F.L.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: ? UEL: NA LEL: NA	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; resp sens (enzyme asthma); sweat, head, chest pain, flu-like symptoms, cough, breathlessness, wheez TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

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<b>Succinonitrile</b>	<b>Formula:</b> NCCH <sub>2</sub> CH <sub>2</sub> CN	<b>CAS#:</b> 110-61-2	<b>RTECS#:</b> WN3850000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.28 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Butanedinitrile; 1,2-Dicyanoethane; Dinile; Ethylene cyanide; Ethylene dicyanide; Succinic dinitrile				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 6 ppm (20 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> none			<b>Measurement Methods (see Table 1):</b> NIOSH Nitriles Criteria Document	
<b>Physical Description:</b> Colorless, odorless, waxy solid. [ <b>Note:</b> Forms cyanide in the body.]				
<b>Chemical &amp; Physical Properties:</b> MW: 80.1 BP: 509°F Sol: 13% Fl.P: 270°F IP: ? Sp.Gr: 0.99 VP(212°F): 2 mmHg MLT: 134°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>60 ppm:</b> Sa <b>150 ppm:</b> Sa:Gf <b>250 ppm:</b> ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; head, dizz, lass, conf, convuls; blurred vision; dysp; abdom pain, nau, vomit <b>TO:</b> Eyes, skin, resp sys, CNS, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Sucrose</b>	<b>Formula:</b> C <sub>12</sub> H <sub>22</sub> O <sub>11</sub>	<b>CAS#:</b> 57-50-1	<b>RTECS#:</b> WN6500000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Beet sugar, Cane sugar, Confectioner's sugar, Granulated sugar, Rock candy, Saccarose, Sugar, Table sugar				
<b>S</b>	<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600
	<b>Physical Description:</b> Hard, white, odorless crystals, lumps, or powder. [ <b>Note:</b> May have a characteristic, caramel odor when heated.]			
	<b>Chemical &amp; Physical Properties:</b> MW: 342.3 BP: Decomposes Sol: 200% Fl.P: NA IP: NA Sp.Gr: 1.59 VP: 0 mmHg (approx) MLT: 320-367°F (Decomposes) UEL: NA LEL: NA MEC: 45 g/m <sup>3</sup> Noncombustible Solid, but fine airborne dust may explode.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.
<b>Incompatibilities and Reactivities:</b> Oxidizers, sulfuric acid, nitric acid				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, skin, upper resp sys; cough <b>TO:</b> Eyes, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air	

<b>Sulfur dioxide</b>		<b>Formula:</b> SO <sub>2</sub>	<b>CAS#:</b> 7446-09-5	<b>RTECS#:</b> WS44550000	<b>IDLH:</b> 100 ppm
<b>Conversion:</b> 1 ppm = 2.62 mg/m <sup>3</sup>		<b>DOT:</b> 1079 125			
<b>Synonyms/Trade Names:</b> Sulfurous acid anhydride, Sulfurous oxide, Sulfur oxide					
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (5 mg/m <sup>3</sup> ) ST 5 ppm (13 mg/m <sup>3</sup> ) OSHA PEL†: TWA 5 ppm (13 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 3800, 6004 OSHA ID104, ID200	
<b>Physical Description:</b> Colorless gas with a characteristic, irritating, pungent odor. [Note: A liquid below 14°F. Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 64.1 BP: 14°F Sol: 10% Fl.P: NA IP: 12.30 eV RGasD: 2.26 VP: 3.2 atm FRZ: -104°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet or contam (liquid) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 20 ppm: CcrS*/Sa* 50 ppm: Sa:Cf*/PapR* 100 ppm: CcrFS/GmFS/PapRTS*/ SaT:Cf*/ScbaF/SaF S: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Powdered alkali metals (such as sodium & potassium), water, ammonia, zinc, aluminum, brass, copper [Note: Reacts with water to form sulfurous acid (H <sub>2</sub> SO <sub>3</sub> ).]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, nose, throat; rhin; choking, cough; reflex bronchoconstriction; liquid: frostbite TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support		

<b>Sulfur hexafluoride</b>		<b>Formula:</b> SF <sub>6</sub>	<b>CAS#:</b> 2551-62-4	<b>RTECS#:</b> WS4900000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.98 mg/m <sup>3</sup>		<b>DOT:</b> 1080 126			
<b>Synonyms/Trade Names:</b> Sulfur fluoride [Note: May contain highly toxic sulfur pentafluoride as an impurity.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (6000 mg/m <sup>3</sup> ) OSHA PEL: TWA 1000 ppm (6000 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 6602	
<b>Physical Description:</b> Colorless, odorless gas. [Note: Shipped as a liquefied compressed gas. Condenses directly to a solid upon cooling.]					
<b>Chemical &amp; Physical Properties:</b> MW: 146.1 BP: Sublimes Sol(77°F): 0.003% Fl.P: NA IP: 19.30 eV RGasD: 5.11 VP: 21.5 atm FRZ: -83°F (Sublimes) UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: N.R. Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Disilane					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Asphy; incr breath rate, pulse rate; slight musc inco, emotional upset; lass, nau, vomit, convuls; liquid: frostbite TO: Resp sys			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support		

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<b>Sulfuric acid</b>	<b>Formula:</b> H <sub>2</sub> SO <sub>4</sub>	<b>CAS#:</b> 7664-93-9	<b>RTECS#:</b> WS5600000	<b>IDLH:</b> 15 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 1830 137; 1831 137 (fuming); 1832 137 (spent)			
<b>Synonyms/Trade Names:</b> Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL: TWA 1 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 7903 OSHA ID113, ID165SG	
<b>Physical Description:</b> Colorless to dark-brown, oily, odorless liquid. [Note: Pure compound is a solid below 51°F. Often used in an aqueous solution.]				
<b>Chemical &amp; Physical Properties:</b> MW: 98.1 BP: 554°F Sol: Miscible F.I.P: NA IP: ? Sp.Gr: 1.84 (96-98% acid) VP: 0.001 mmHg FRZ: 51°F UEL: NA LEL: NA Noncombustible Liquid, but capable of igniting finely divided combustible materials.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>1%) Quick drench (>1%)		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>15 mg/m<sup>3</sup>:</b> Sa:CfE/PapRAgHieE/ CcrFAg100/GmFAg100/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFAg100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Organic materials, chlorates, carbides, fulminates, water, powdered metals [Note: Reacts violently with water with evolution of heat. Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; pulm edema, bron; emphy; conj; stomatis; dental erosion; eye, skin burns; derm TO: Eyes, skin, resp sys, teeth			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Sulfur monochloride</b>	<b>Formula:</b> S <sub>2</sub> Cl <sub>2</sub>	<b>CAS#:</b> 10025-67-9	<b>RTECS#:</b> WS4300000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 5.52 mg/m <sup>3</sup>	<b>DOT:</b> 1828 137			
<b>Synonyms/Trade Names:</b> Sulfur chloride, Sulfur subchloride, Thiosulfurous dichloride				
<b>Exposure Limits:</b> NIOSH REL: C 1 ppm (6 mg/m <sup>3</sup> ) OSHA PEL†: TWA 1 ppm (6 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Light-amber to yellow-red, oily liquid with a pungent, nauseating, irritating odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 135.0 BP: 280°F Sol: Decomposes F.I.P: 245°F IP: 9.40 eV Sp.Gr: 1.68 VP: 7 mmHg FRZ: -107°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>5 ppm:</b> CcrFS/GmFS/PapRSE/ ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Peroxides, oxides of phosphorous, organics, water [Note: Decomposes violently in water to form hydrochloric acid, sulfur dioxide, sulfur, sulfite, thiosulfate, and hydrogen sulfide. Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; lac; cough; eye, skin burns; pulm edema TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Sulfur pentafluoride</b>	<b>Formula:</b> S <sub>2</sub> F <sub>10</sub>	<b>CAS#:</b> 5714-22-7	<b>RTECS#:</b> WS4480000	<b>IDLH:</b> 1 ppm
<b>Conversion:</b> 1 ppm = 10.39 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Disulfur decafluoride, Sulfur decafluoride				
<b>Exposure Limits:</b> NIOSH REL: C 0.01 ppm (0.1 mg/m <sup>3</sup> ) OSHA PEL†: TWA 0.025 ppm (0.25 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid or gas (above 84°F) with an odor like sulfur dioxide.				
<b>Chemical &amp; Physical Properties:</b> MW: 254.1 BP: 84°F Sol: Insoluble Fl.P: NA IP: ? RGasD: 8.77 Sp.Gr(32°F): 2.08 VP: 561 mmHg FRZ: -134°F UEL: NA LEL: NA Noncombustible Liquid Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> N.R. <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>0.1 ppm:</b> Sa <b>0.25 ppm:</b> Sa:Cf <b>0.5 ppm:</b> SaT:Cf/ScbaF/SaF <b>1 ppm:</b> Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFAG/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; in animals: pulm edema, hemorrh TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Sulfur tetrafluoride</b>	<b>Formula:</b> SF <sub>4</sub>	<b>CAS#:</b> 7783-60-0	<b>RTECS#:</b> WT4800000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.42 mg/m <sup>3</sup>	<b>DOT:</b> 2418 125			
<b>Synonyms/Trade Names:</b> Tetrafluorosulfurane				
<b>Exposure Limits:</b> NIOSH REL: C 0.1 ppm (0.4 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA ID110	
<b>Physical Description:</b> Colorless gas with an odor like sulfur dioxide. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 108.1 BP: -41°F Sol: Reacts Fl.P: NA IP: 12.63 eV RGasD: 3.78 VP(70°F): 10.5 atm FRZ: -185°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash	<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.		
<b>Incompatibilities and Reactivities:</b> Moisture, concentrated sulfuric acid, dioxygen difluoride [Note: Readily hydrolyzed by moisture, forming hydrofluoric acid & thionyl fluoride.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, muc memb; eye, skin burns (from SF <sub>4</sub> releasing hydrofluoric acid on exposure to moisture); liquid: frostbite; in animals: dysp, lass, rhin TO: Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support		

S

<b>Sulfuryl fluoride</b>	<b>Formula:</b> SO <sub>2</sub> F <sub>2</sub>	<b>CAS#:</b> 2699-79-8	<b>RTECS#:</b> WT5075000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 4.18 mg/m <sup>3</sup>		<b>DOT:</b> 2191 123		
<b>Synonyms/Trade Names:</b> Sulfur difluoride dioxide, Vikane®				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 ppm (20 mg/m <sup>3</sup> ) ST 10 ppm (40 mg/m <sup>3</sup> ) OSHA PEL†: TWA 5 ppm (20 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 6012	
<b>Physical Description:</b> Colorless, odorless gas. [insecticide/fumigant] [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 102.1 BP: -68°F Sol(32°F): 0.2% F.L.P: NA IP: 13.04 eV RGasD: 3.72 VP(70°F): 15.8 atm FRZ: -212°F UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: N.R. Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 50 ppm: Sa* 125 ppm: Sa;Cf* 200 ppm: ScbaF/SaF §: ScbaF;Pd,Pp/SaF;Pd,Pp:AScba Escape: GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Conj, rhinitis, pharyngitis, pares; liquid: frostbite: in animals: narco, tremor, convuls; pulm edema; kidney inj TO: Eyes, skin, resp sys, CNS, kidneys			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support	

<b>Sulprofos</b>	<b>Formula:</b> C <sub>12</sub> H <sub>10</sub> O <sub>2</sub> PS <sub>3</sub>	<b>CAS#:</b> 35400-43-2	<b>RTECS#:</b> TE4165000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 13.19 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Bolstar®, O-Ethyl O-(4-methylthio)phenyl S-propylphosphorodithioate				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 5600 OSHA PV2037	
<b>Physical Description:</b> Tan-colored liquid with a sulfide-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 322.5 BP: ? Sol: Low F.L.P: ? IP: ? Sp.Gr: 1.20 VP: <8 mmHg FRZ: ? UEL: ? LEL: ?	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing SY: Nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp TO: Resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>2,4,5-T</b>	<b>Formula:</b> Cl <sub>2</sub> C <sub>6</sub> H <sub>2</sub> OCH <sub>2</sub> COOH	<b>CAS#:</b> 93-76-5	<b>RTECS#:</b> AJ8400000	<b>IDLH:</b> 250 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2765 152			
<b>Synonyms/Trade Names:</b> 2,4,5-Trichlorophenoxyacetic acid				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> OSHA PEL: TWA 10 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5001	
<b>Physical Description:</b> Colorless to tan, odorless, crystalline solid. [herbicide]				
<b>Chemical &amp; Physical Properties:</b> MW: 255.5 BP: Decomposes Sol(77°F): 0.03% Fl.P: ? IP: ? Sp.Gr: 1.80 VP: 1 x 10 <sup>-7</sup> mmHg MLT: 307°F UEL: ? LEL: ? Combustible Solid, but burns with difficulty.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 50 mg/m <sup>3</sup> : Qm 100 mg/m <sup>3</sup> : 95XQ/Sa 250 mg/m <sup>3</sup> : Sa:Cf/100F/PaprHie/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: ataxia; skin irrit, acne-like rash; liver damage TO: Skin, liver, GI tract		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Talc (containing no asbestos and less than 1% quartz)</b>	<b>Formula:</b> Mg <sub>3</sub> Si <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub>	<b>CAS#:</b> 14807-96-6	<b>RTECS#:</b> WWW2710000	<b>IDLH:</b> 1000 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Hydrous magnesium silicate, Steatite talc				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 20 mppcf			<b>Measurement Methods</b> (see Table 1): NIOSH P&CAM355 (III)	
<b>Physical Description:</b> Odorless, white powder.				
<b>Chemical &amp; Physical Properties:</b> MW: Varies BP: ? Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 2.70-2.80 VP: 0 mmHg (approx) MLT: 1652°F to 1832°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 10 mg/m <sup>3</sup> : Qm 20 mg/m <sup>3</sup> : 95XQ/Sa 50 mg/m <sup>3</sup> : PaprHie/Sa:Cf 100 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 1000 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Fibrotic pneumoconiosis, irrit eyes TO: Eyes, resp sys, CVS		<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air		

T

<b>Tantalum (metal and oxide dust, as Ta)</b>	<b>Formula:</b> Ta (metal)	<b>CAS#:</b> 7440-25-7 (metal)	<b>RTECS#:</b> WW5505000 (metal)	<b>IDLH:</b> 2500 mg/m <sup>3</sup> (as Ta)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Tantalum metal: Tantalum-181 Synonyms of other tantalum dusts (including oxide dusts) vary depending upon the specific compound.				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> ST 10 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> NIOSH 0500	
<b>Physical Description:</b> Metal: Steel-blue to gray solid or black, odorless powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 180.9 BP: 9797°F Sol: Insoluble F.L.P: NA IP: NA Sp.Gr: 16.65 (metal) 14.40 (powder) VP: 0 mmHg (approx) MLT: 5425°F UEL: NA LEL: NA MEC: <200 g/m <sup>3</sup> Metal: Combustible Solid; powder ignites SPONTANEOUSLY in air.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 25 mg/m <sup>3</sup> : Qm 50 mg/m <sup>3</sup> : 95XQ/Sa 125 mg/m <sup>3</sup> : Sa:Cf/PaprHie 250 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ SbcaF/SaF 2500 mg/m <sup>3</sup> : Sa:Pd,Pp §: SbcaF:Pd,Pp/SaF:Pd,Pp:ASbca Escape: HieF/SbcaE	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers, bromine trifluoride, fluorine			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin; in animals: pulm irrit TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Resp support	

<b>TEDP</b>	<b>Formula:</b> [(CH <sub>3</sub> CH <sub>2</sub> O) <sub>2</sub> PS] <sub>2</sub> O	<b>CAS#:</b> 3689-24-5	<b>RTECS#:</b> XN4375000	<b>IDLH:</b> 10 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 13.18 mg/m <sup>3</sup>	<b>DOT:</b> 1704 153			
<b>Synonyms/Trade Names:</b> Bladafum®, Dithion®, Sulfotep, Tetraethyl dithionopyrophosphate, Tetraethyl dithiopyrophosphate, Thiotep®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.2 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.2 mg/m <sup>3</sup> [skin]			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Pale-yellow liquid with a garlic-like odor. [Note: A pesticide that may be absorbed on a solid carrier or mixed in a more flammable liquid.]				
<b>Chemical &amp; Physical Properties:</b> MW: 322.3 BP: Decomposes Sol: 0.0007% F.L.P: ? IP: ? Sp.Gr(77°F): 1.20 VP: 0.0002 mmHg FRZ: ? UEL: ? LEL: ? Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 2 mg/m <sup>3</sup> : Sa 5 mg/m <sup>3</sup> : Sa:Cf 10 mg/m <sup>3</sup> : SbcaF/SaF §: SbcaF:Pd,Pp/SaF:Pd,Pp:ASbca Escape: GmFOv100/SbcaE	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers, iron [Note: Corrosive to iron.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; eye pain, blurred vision, lac; rhin; head; cyan; anor; nau, vomit, diarr; local sweat, lass, twitch, para, Cheyne-Stokes respiration, convuls, low BP, card irreg TO: Eyes, skin, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Tellurium</b>	<b>Formula:</b> Te	<b>CAS#:</b> 13494-80-9	<b>RTECS#:</b> WY2625000	<b>IDLH:</b> 25 mg/m <sup>3</sup> (as Te)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Aurum paradoxum, Metallum problematum				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.1 mg/m <sup>3</sup> OSHA PEL*: TWA 0.1 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other tellurium compounds (as Te) except Tellurium hexafluoride and Bismuth telluride.]			<b>Measurement Methods</b> (see Table 1): NIOSH 7300, 7301, 7303, 9102 OSHA ID121	
<b>Physical Description:</b> Odorless, dark-gray to brown, amorphous powder or grayish-white, brittle solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 127.6 BP: 1814°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 6.24 VP: 0 mmHg (approx) MLT: 842°F UEL: NA LEL: NA Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 0.5 mg/m <sup>3</sup> : Qm 1 mg/m <sup>3</sup> : 95XQ/Sa 2.5 mg/m <sup>3</sup> : Sa:Cf/PaprHie 5 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ScbaF/SaF 25 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, chlorine, cadmium				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Garlic breath, sweat; dry mouth, metallic taste; drow; anor, nau, no sweat; derm; in animals: CNS, red blood cell changes TO: Skin, CNS, blood			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Tellurium hexafluoride</b>	<b>Formula:</b> TeF <sub>6</sub>	<b>CAS#:</b> 7783-80-4	<b>RTECS#:</b> WY2800000	<b>IDLH:</b> 1 ppm
<b>Conversion:</b> 1 ppm = 9.88 mg/m <sup>3</sup>	<b>DOT:</b> 2195 125			
<b>Synonyms/Trade Names:</b> Tellurium fluoride				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.02 ppm (0.2 mg/m <sup>3</sup> ) OSHA PEL: TWA 0.02 ppm (0.2 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH S187 (II-3)	
<b>Physical Description:</b> Colorless gas with a repulsive odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 241.6 BP: Sublimes Sol: Decomposes Fl.P: NA IP: ? RGasD: 8.34 VP: >1 atm FRZ: -36°F (Sublimes) UEL: NA LEL: NA Nonflammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 0.2 ppm: Sa 0.5 ppm: Sa:Cf 1 ppm: SaT:Cf/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE		
<b>Incompatibilities and Reactivities:</b> Water [Note: Hydrolyzes slowly in water to telluric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Head; dysp; garlic breath; in animals: pulm edema TO: Resp sys			<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Temephos</b>	<b>Formula:</b> S[C <sub>6</sub> H <sub>4</sub> OP(S)(OCH <sub>3</sub> ) <sub>2</sub> ] <sub>2</sub>	<b>CAS#:</b> 3383-96-8	<b>RTECS#:</b> TF6890000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Abate®; Temefos; O, O, O'-Tetramethyl O, O'-thiodi-p-phenylene phosphorothioate				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600 OSHA PV2056	
<b>Physical Description:</b> White, crystalline solid or liquid (above 87°F). [insecticide] [Note: Technical grade is a viscous, brown liquid.]				
<b>Chemical &amp; Physical Properties:</b> MW: 466.5 BP: 248-257°F (Decomposes) Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: 1.32 VP(77°F): 0.00000007 mmHg MLT: 87°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, blurred vision; dizz; dysp; saliv; abdom cramps, nau, diarr, vomit TO: Eyes, resp sys, CNS, CVS, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>TEPP</b>	<b>Formula:</b> [(CH <sub>3</sub> CH <sub>2</sub> O) <sub>2</sub> PO] <sub>2</sub> O	<b>CAS#:</b> 107-49-3	<b>RTECS#:</b> UX6825000	<b>IDLH:</b> 5 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 11.87 mg/m <sup>3</sup>	<b>DOT:</b> 2783 152 (solid); 3018 152 (liquid)			
<b>Synonyms/Trade Names:</b> Ethyl pyrophosphate, Tetraethyl pyrophosphate, Tetron®				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.05 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.05 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2504	
<b>Physical Description:</b> Colorless to amber liquid with a faint, fruity odor. [insecticide] [Note: A solid below 32°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 290.2 BP: Decomposes Sol: Miscible Fl.P: NA IP: ? Sp.Gr: 1.19 VP: 0.0002 mmHg FRZ: 32°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.5 mg/m<sup>3</sup>:</b> Sa <b>1.25 mg/m<sup>3</sup>:</b> Sa:Cf <b>2.5 mg/m<sup>3</sup>:</b> SaT:Cf/ScbaF/SaF <b>5 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, alkalis, water [Note: Hydrolyzes quickly in water to form pyrophosphoric acid.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Eye pain, blurred vision, lac; rhin; head, chest tight, cyan; anor, nau, vomit, diarr; lass, twitch, para, Cheyne-Stokes respiration, convuls; low BP, card irreg; sweat TO: Eyes, resp sys, CNS, CVS, GI tract, blood chol			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>m-Terphenyl</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> C <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 92-06-8	<b>RTECS#:</b> WZ6470000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 9.57 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> m-Diphenylbenzene; 1,3-Diphenylbenzene; Isodiphenylbenzene; 3-Phenylbiphenyl; 1,3-Terphenyl; meta-Terphenyl; m-Triphenyl					
<b>Exposure Limits:</b> NIOSH REL: C 5 mg/m <sup>3</sup> (0.5 ppm) OSHA PEL†: C 9 mg/m <sup>3</sup> (1 ppm)				<b>Measurement Methods</b> (see Table 1): NIOSH 5021	
<b>Physical Description:</b> Yellow solid (needles).					
<b>Chemical &amp; Physical Properties:</b> MW: 230.3 BP: 689°F Sol: Insoluble Fl.P(oc): 375°F IP: 8.01 Sp.Gr: 1.23 VP(200°F): 0.01 mmHg MLT: 192°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> 25 mg/m <sup>3</sup> : Qm£ 50 mg/m <sup>3</sup> : 95XQ£/Sa£ 125 mg/m <sup>3</sup> : Sa:Cf£/PaprHie£ 250 mg/m <sup>3</sup> : 100F/ScbaF/SaF 500 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; thermal skin burns; head; sore throat; in animals: liver, kidney damage TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Terphenyl</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> C <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 84-15-1	<b>RTECS#:</b> WZ6472000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 9.42 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> o-Diphenylbenzene; 1,2-Diphenylbenzene; 2-Phenylbiphenyl; 1,2-Terphenyl; ortho-Terphenyl; o-Triphenyl					
<b>Exposure Limits:</b> NIOSH REL: C 5 mg/m <sup>3</sup> (0.5 ppm) OSHA PEL†: C 9 mg/m <sup>3</sup> (1 ppm)				<b>Measurement Methods</b> (see Table 1): NIOSH 5021	
<b>Physical Description:</b> Colorless or light-yellow solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 230.3 BP: 630°F Sol: Insoluble Fl.P(oc): 325°F IP: 7.99 eV Sp.Gr: 1.1 VP(200°F): 0.09 mmHg MLT: 136°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> 25 mg/m <sup>3</sup> : Qm£ 50 mg/m <sup>3</sup> : 95XQ£/Sa£ 125 mg/m <sup>3</sup> : Sa:Cf£/PaprHie£ 250 mg/m <sup>3</sup> : 100F/ScbaF/SaF 500 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; thermal skin burns; head; sore throat; in animals: liver, kidney damage TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>p-Terphenyl</b>		<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> C <sub>6</sub> H <sub>5</sub>	<b>CAS#:</b> 92-94-4	<b>RTECS#:</b> WZ6475000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b> 1 ppm = 9.57 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> p-Diphenylbenzene; 1,4-Diphenylbenzene; 4-Phenylbiphenyl; 1,4-Terphenyl; para-Terphenyl; p-Triphenyl					
<b>Exposure Limits:</b> NIOSH REL: C 5 mg/m <sup>3</sup> (0.5 ppm) OSHA PEL†: C 9 mg/m <sup>3</sup> (1 ppm)				<b>Measurement Methods</b> (see Table 1): NIOSH 5021	
<b>Physical Description:</b> White or light-yellow solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 230.3 BP: 761°F Sol: Insoluble F.I.P: 405°F IP: 7.78 Sp.Gr: 1.23 VP: Very low MLT: 415°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 25 mg/m <sup>3</sup> : QmE 50 mg/m <sup>3</sup> : 95XQ£/Sa£ 125 mg/m <sup>3</sup> : Sa:Cf£/Paprh£f 250 mg/m <sup>3</sup> : 100F/ScbaF/SaF 500 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; thermal skin burns; head; sore throat; in animals: liver, kidney damage TO: Eyes, skin, resp sys, liver, kidneys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

<b>2,3,7,8-Tetrachloro-dibenzo-p-dioxin</b>		<b>Formula:</b> C <sub>12</sub> H <sub>4</sub> Cl <sub>4</sub> O <sub>2</sub>	<b>CAS#:</b> 1746-01-6	<b>RTECS#:</b> HP3500000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Dioxin; Dioxine; TCDBD; TCDD; 2,3,7,8-TCDD [Note: Formed during past production of 2,4,5-trichlorophenol, 2,4,5-T & 2(2,4,5-trichlorophenoxy)propionic acid.]					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to white, crystalline solid. [Note: Exposure may occur through contact at previously contaminated worksites.]					
<b>Chemical &amp; Physical Properties:</b> MW: 322.0 BP: Decomposes Sol: 0.00000002% F.I.P: ? IP: ? Sp.Gr: ? VP(77°F): 0.000002 mmHg MLT: 581°F UEL: ? LEL: ?		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> UV light (decomposes)					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes; allergic derm, chloracne; porphyria; GI dist; possible repro, terato effects; in animals: liver, kidney damage; hemorr; [carc] TO: Eyes, skin, liver, kidneys, repro sys [in animals: tumors at many sites]			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed		

<b>1,1,1,2-Tetrachloro-2,2-difluoroethane</b>	<b>Formula:</b> CCl <sub>3</sub> CClF <sub>2</sub>	<b>CAS#:</b> 76-11-9	<b>RTECS#:</b> K11425000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 8.34 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 2,2-Difluoro-1,1,1,2-tetrachloroethane; Freon® 112a; Halocarbon 112a; Refrigerant 112a				
<b>Exposure Limits:</b> NIOSH REL: TWA 500 ppm (4170 mg/m <sup>3</sup> ) OSHA PEL: TWA 500 ppm (4170 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1016 OSHA 7	
<b>Physical Description:</b> Colorless solid with a slight, ether-like odor. [Note: A liquid above 105°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 203.8 BP: 197°F Sol: 0.01% Fl.P: NA IP: ? Sp.Gr: 1.65 VP: 40 mmHg MLT: 105°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOV/ScbaE		
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as potassium, beryllium, powdered aluminum, zinc, calcium, magnesium & sodium; acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin; CNS depres; pulm edema; drow; dysp TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1,1,2,2-Tetrachloro-1,2-difluoroethane</b>	<b>Formula:</b> CCl <sub>2</sub> FCCl <sub>2</sub> F	<b>CAS#:</b> 76-12-0	<b>RTECS#:</b> K11420000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 8.34 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2-Difluoro-1,1,2,2-tetrachloroethane; Freon® 112; Halocarbon 112; Refrigerant 112				
<b>Exposure Limits:</b> NIOSH REL: TWA 500 ppm (4170 mg/m <sup>3</sup> ) OSHA PEL: TWA 500 ppm (4170 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1016 OSHA 7	
<b>Physical Description:</b> Colorless solid or liquid (above 77°F) with a slight, ether-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 203.8 BP: 199°F Sol(77°F): 0.01% Fl.P: NA IP: 11.30 eV Sp.Gr: 1.65 VP: 40 mmHg MLT: 77°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOV/ScbaE		
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as potassium, beryllium, powdered aluminum, zinc, magnesium, calcium & sodium; acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit eyes, skin; conj; pulm edema; narco TO: Eyes, skin, resp sys, CNS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1,1,1,2-Tetrachloroethane</b>	<b>Formula:</b> CCl <sub>3</sub> CH <sub>2</sub> Cl	<b>CAS#:</b> 630-20-6	<b>RTECS#:</b> K18450000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1702 151		
<b>Synonyms/Trade Names:</b> None				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Handle with caution in the workplace. See Appendix C (Chloroethanes) <b>OSHA PEL:</b> none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Yellowish-red liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 167.9 BP: 267°F Sol: 0.1% Fl.P: ? IP: ? Sp.Gr: 1.54 VP(77°F): 14 mmHg FRZ: -94°F UEL: ? LEL: ?	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Potassium; sodium; dinitrogen tetraoxide; potassium hydroxide; nitrogen tetroxide; sodium potassium alloy; 2,4-dinitrophenyl disulfide				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin; lass, restless, irreg respiration, musc inco; in animals: liver changes <b>TO:</b> Eyes, skin, CNS, liver			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1,1,2,2-Tetrachloroethane</b>	<b>Formula:</b> CHCl <sub>2</sub> CHCl <sub>2</sub>	<b>CAS#:</b> 79-34-5	<b>RTECS#:</b> K18575000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 6.87 mg/m <sup>3</sup>		<b>DOT:</b> 1702 151		
<b>Synonyms/Trade Names:</b> Acetylene tetrachloride, Symmetrical tetrachloroethane				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 1 ppm (7 mg/m <sup>3</sup> ) [skin] See Appendix A See Appendix C (Chloroethanes) <b>OSHA PEL†:</b> TWA 5 ppm (35 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 1019, 2562 <b>OSHA</b> 7	
<b>Physical Description:</b> Colorless to pale-yellow liquid with a pungent, chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 167.9 BP: 296°F Sol: 0.3% Fl.P: NA IP: 11.10 eV Sp.Gr(77°F): 1.59 VP: 5 mmHg FRZ: -33°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF;Pd,Pp/SaF;Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals, strong caustics, fuming sulfuric acid [Note: Degrades slowly when exposed to air.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Nau, vomit, abdom pain; tremor fingers; jaun, hepatitis, liver tend; derm; leucyt; kidney damage; [carc] <b>TO:</b> Skin, liver, kidneys, CNS, GI tract [in animals: liver tumors]			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Tetrachloroethylene</b>	<b>Formula:</b> Cl <sub>2</sub> C=CCl <sub>2</sub>	<b>CAS#:</b> 127-18-4	<b>RTECS#:</b> KX3850000	<b>IDLH:</b> Ca [150 ppm]
<b>Conversion:</b> 1 ppm = 6.78 mg/m <sup>3</sup>		<b>DOT:</b> 1897 160		
<b>Synonyms/Trade Names:</b> Perchloroethylene, Perchloroethylene, Perk, Tetrachlorethylene				
<b>Exposure Limits:</b> NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)			<b>Measurement Methods (see Table 1):</b> NIOSH 1003 OSHA 1001	
<b>Physical Description:</b> Colorless liquid with a mild, chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 165.8 BP: 250°F Sol: 0.02% Fl.P: NA IP: 9.32 eV Sp.Gr: 1.62 VP: 14 mmHg FRZ: -2°F UEL: NA LEL: NA Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE
			<b>Incompatibilities and Reactivities:</b> Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash	
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; nau; flush face, neck; dizz, inco; head, drow; skin eryt; liver damage; [carc] TO: Eyes, skin, resp sys, liver, kidneys, CNS [in animals: liver tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Tetrachloronaphthalene</b>	<b>Formula:</b> C <sub>10</sub> H <sub>4</sub> Cl <sub>4</sub>	<b>CAS#:</b> 1335-88-2	<b>RTECS#:</b> QK3700000	<b>IDLH:</b> See Appendix F
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Halowax®, Nibren wax, Seekay wax				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 2 mg/m <sup>3</sup> [skin]			<b>Measurement Methods (see Table 1):</b> NIOSH S130 (II-2)	
<b>Physical Description:</b> Colorless to pale-yellow solid with an aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 265.9 BP: 599-680°F Sol: Insoluble Fl.P(oc): 410°F IP: ? Sp.Gr: 1.59-1.65 VP: <1 mmHg MLT: 360°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 20 mg/m <sup>3</sup> ; ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE  <b>See Appendix F</b>
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Acne-form derm; head, lass, anor, dizz; jaun, liver inj TO: Liver, skin, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Tetraethyl lead (as Pb)</b>		<b>Formula:</b> Pb(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub>	<b>CAS#:</b> 78-00-2	<b>RTECS#:</b> TP4550000	<b>IDLH:</b> 40 mg/m <sup>3</sup> (as Pb)
<b>Conversion:</b>		<b>DOT:</b> 1649 131			
<b>Synonyms/Trade Names:</b> Lead tetraethyl, TEL, Tetraethylplumbane					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.075 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.075 mg/m <sup>3</sup> [skin]				<b>Measurement Methods (see Table 1):</b> NIOSH 2533	
<b>Physical Description:</b> Colorless liquid (unless dyed red, orange, or blue) with a pleasant, sweet odor. [Note: Main usage is in anti-knock additives for gasoline.]					
<b>Chemical &amp; Physical Properties:</b> MW: 323.5 BP: 228°F (Decomposes) Sol: 0.00002% Fl.P: 200°F IP: 11.10 eV Sp.Gr: 1.65 VP: 0.2 mmHg FRZ: -202°F UEL: ? LEL: 1.8% Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact (>0.1%) Eyes: Prevent eye contact Wash skin: When contam (>0.1%) Remove: When wet or contam (>0.1%) Change: Daily Provide: Quick drench (>0.1%)		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 0.75 mg/m <sup>3</sup> : Sa 1.875 mg/m <sup>3</sup> : Sa: Cf 3.75 mg/m <sup>3</sup> : Sa: T: Cf/ScbaF/SaF 40 mg/m <sup>3</sup> : Sa: Pd, Pp \$: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, sulfuryl chloride, rust, potassium permanganate [Note: Decomposes slowly at room temperature and more rapidly at higher temperatures.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Insom, lass, anxiety; tremor, hyper-reflexia, spasticity; bradycardia, hypotension, hypothermia, pallor, nau, anor, low-wgt; conf, halu, psychosis, mania, convuls, coma; eye irrit TO: CNS, CVS, kidneys, eyes				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Tetrahydrofuran</b>		<b>Formula:</b> C <sub>4</sub> H <sub>8</sub> O	<b>CAS#:</b> 109-99-9	<b>RTECS#:</b> LU5950000	<b>IDLH:</b> 2000 ppm [10%LEL]
<b>Conversion:</b> 1 ppm = 2.95 mg/m <sup>3</sup>		<b>DOT:</b> 2056 127			
<b>Synonyms/Trade Names:</b> Diethylene oxide; 1,4-Epoxybutane; Tetramethylene oxide; THF					
<b>Exposure Limits:</b> NIOSH REL: TWA 200 ppm (590 mg/m <sup>3</sup> ) ST 250 ppm (735 mg/m <sup>3</sup> ) OSHA PEL†: TWA 200 ppm (590 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1609, 3800 OSHA 7	
<b>Physical Description:</b> Colorless liquid with an ether-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 72.1 BP: 151°F Sol: Miscible Fl.P: 6°F IP: 9.45 eV Sp.Gr: 0.89 VP: 132 mmHg FRZ: -163°F UEL: 11.8% LEL: 2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 2000 ppm: Sa: Cf£/CcrFOv/GmFOv/ Paprov£/ScbaF/SaF \$: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, lithium-aluminum alloys [Note: Peroxides may accumulate upon prolonged storage in presence of air.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con, Ing SY: Irrit eyes, upper resp sys; nau, dizz, head, CNS depres TO: Eyes, resp sys, CNS				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed	

<b>Tetramethyl lead (as Pb)</b>	<b>Formula:</b> Pb(CH <sub>3</sub> ) <sub>4</sub>	<b>CAS#:</b> 75-74-1	<b>RTECS#:</b> TP4725000	<b>IDLH:</b> 40 mg/m <sup>3</sup> (as Pb)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Lead tetramethyl, Tetramethylplumbane, TML				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.075 mg/m <sup>3</sup> [skin] OSHA PEL: TWA 0.075 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2534	
<b>Physical Description:</b> Colorless liquid (unless dyed red, orange, or blue) with a fruity odor. [Note: Main usage is in anti-knock additives for gasoline.]				
<b>Chemical &amp; Physical Properties:</b> MW: 267.3 BP: 212°F (Decomposes) Sol: 0.0022% Fl.P: 100°F IP: 8.50 eV Sp.Gr: 2.00 VP: 23 mmHg FRZ: -15°F UEL: ? LEL: ? Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (>0.1%) <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam (>0.1%) <b>Remove:</b> When wet or contam (>0.1%) <b>Change:</b> Daily <b>Provide:</b> Quick drench (>0.1%)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.75 mg/m<sup>3</sup>:</b> Sa <b>1.875 mg/m<sup>3</sup>:</b> Sa:Cf <b>3.75 mg/m<sup>3</sup>:</b> Sa:T:Cf/ScbaF/SaF <b>40 mg/m<sup>3</sup>:</b> Sa:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers such as sulfuryl chloride or potassium permanganate				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Insom, bad dreams, restless, anxious; hypotension; nau, anor; delirium, mania, convuls; coma TO: CNS, CVS, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Tetramethyl succinonitrile</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> C(CN)C(CN)(CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 3333-52-6	<b>RTECS#:</b> WN4025000	<b>IDLH:</b> 5 ppm
<b>Conversion:</b> 1 ppm = 5.57 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Tetramethyl succinodinitrile, TMSN				
<b>Exposure Limits:</b> NIOSH REL: TWA 3 mg/m <sup>3</sup> (0.5 ppm) [skin] OSHA PEL: TWA 3 mg/m <sup>3</sup> (0.5 ppm) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH S155 (II-3) OSHA 7	
<b>Physical Description:</b> Colorless, odorless solid. [Note: Forms cyanide in the body.]				
<b>Chemical &amp; Physical Properties:</b> MW: 136.2 BP: Sublimes Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: 1.07 VP: ? MLT: 338°F (Sublimes) UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>28 mg/m<sup>3</sup>:</b> Sa/ScbaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Head, nau; convuls, coma; liver, kidney, GI effects TO: CNS, liver, kidneys, GI tract			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Tetranitromethane</b>		<b>Formula:</b> C(NO <sub>2</sub> ) <sub>4</sub>	<b>CAS#:</b> 509-14-8	<b>RTECS#:</b> PB4025000	<b>IDLH:</b> 4 ppm
<b>Conversion:</b> 1 ppm = 8.02 mg/m <sup>3</sup>		<b>DOT:</b> 1510 143			
<b>Synonyms/Trade Names:</b> Tetan, TNM					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm (8 mg/m <sup>3</sup> ) OSHA PEL: TWA 1 ppm (8 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 3513	
<b>Physical Description:</b> Colorless to pale-yellow liquid or solid (below 57°F) with a pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 196.0 BP: 259°F Sol: Insoluble Fl.P: ? IP: ? Sp.Gr: 1.62 VP: 8 mmHg FRZ: 57°F UEL: ? LEL: ? Combustible Liquid, but difficult to ignite.		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: Daily Provide: Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 4 ppm: Sa:Cff/CcrFS <sub>2</sub> /GmFS <sub>2</sub> / PaprS <sub>2</sub> ℓ/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS <sub>2</sub> /ScbaE	
<b>Incompatibilities and Reactivities:</b> Hydrocarbons, alkalis, metals, oxidizers, aluminum, toluene, cotton [Note: Combustible material wet with tetranitromethane may be highly explosive.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, head; chest pain, dysp; methemo, cyan; skin burns TO: Eyes, skin, resp sys, blood, CNS			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Tetrasodium pyrophosphate</b>		<b>Formula:</b> Na <sub>4</sub> P <sub>2</sub> O <sub>7</sub>	<b>CAS#:</b> 7722-88-5	<b>RTECS#:</b> UX7350000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Pyrophosphate, Sodium pyrophosphate, Tetrasodium diphosphate, Tetrasodium pyrophosphate (anhydrous), TSPP					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> Odorless, white powder or granules. [Note: The decahydrate (Na <sub>4</sub> P <sub>2</sub> O <sub>7</sub> ×10H <sub>2</sub> O) is in the form of colorless, transparent crystals.]					
<b>Chemical &amp; Physical Properties:</b> MW: 265.9 BP: Decomposes Sol(77°F): 7% Fl.P: NA IP: NA Sp.Gr: 2.45 VP: 0 mmHg (approx) MLT: 1810°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash (solution)		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Strong acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; derm TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Water wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>Tetryl</b>	<b>Formula:</b> (NO <sub>2</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> N(NO <sub>2</sub> )CH <sub>3</sub>	<b>CAS#:</b> 479-45-8	<b>RTECS#:</b> BY6300000	<b>IDLH:</b> 750 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> N-Methyl-N,2,4,6-tetranitroaniline; Nitramine; 2,4,6-Tetryl; 2,4,6-Trinitrophenyl-N-methylnitramine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1.5 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 1.5 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH S225</b> (II-3)	
<b>Physical Description:</b> Colorless to yellow, odorless, crystalline solid.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 287.2 <b>BP:</b> 356-374°F (Explodes) <b>Sol:</b> 0.02% <b>Fl.P:</b> Explodes <b>IP:</b> ? <b>Sp.Gr:</b> 1.57 <b>VP:</b> <1 mmHg <b>MLT:</b> 268°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid (Class A Explosive)	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>7.5 mg/m<sup>3</sup>:</b> Qm <b>15 mg/m<sup>3</sup>:</b> 95XQ*/Sa* <b>37.5 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie* <b>75 mg/m<sup>3</sup>:</b> 100F/ScbaF/SaF <b>750 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizable materials, hydrazine				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Sens derm, itch, eryt; edema on nasal folds, cheeks, neck; kera; sneez; anemia; cough, coryza; irrity; mal, head, lass, insom; nau, vomit; liver, kidney damage <b>TO:</b> Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Thallium (soluble compounds, as TI)</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 15 mg/m <sup>3</sup> (as TI)
<b>Conversion:</b>	<b>DOT:</b> 1707 151 (compounds, n.o.s.)			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific soluble thallium compound.				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.1 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 0.1 mg/m <sup>3</sup> [skin]			<b>Measurement Methods</b> (see Table 1): <b>NIOSH</b> 7300, 7301, 7303, 9102 <b>OSHA</b> ID121	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble thallium compound.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble thallium compound.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>0.5 mg/m<sup>3</sup>:</b> Qm <b>1 mg/m<sup>3</sup>:</b> 95XQ/Sa <b>2.5 mg/m<sup>3</sup>:</b> Sa:C/PapHie <b>5 mg/m<sup>3</sup>:</b> 100F/SaT:Cf/PaprTHie/ScbaF/SaF <b>15 mg/m<sup>3</sup>:</b> SaF:Pd,Pp <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Nau, diarr, abdom pain, vomit; ptosis, strabismus; peri neuritis, tremor; retster tight, chest pain, pulm edema; convuls, chorea, psychosis; liver, kidney damage; alopecia; pares legs <b>TO:</b> Eyes, resp sys, CNS, liver, kidneys, GI tract, body hair			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>4,4'-Thiobis(6-tert-butyl-m-cresol)</b>	<b>Formula:</b> [CH <sub>3</sub> (OH)C <sub>6</sub> H <sub>2</sub> C(CH <sub>3</sub> ) <sub>3</sub> ] <sub>2</sub> S	<b>CAS#:</b> 96-69-5	<b>RTECS#:</b> GP3150000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4,4'-Thiobis(3-methyl-6-tert-butylphenol); 1,1'-Thiobis(2-methyl-4-hydroxy-5-tert-butylbenzene)				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) <b>OSHA PEL†:</b> TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 0500, 0600</b>	
<b>Physical Description:</b> Light-gray to tan powder with a slightly aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 358.6 <b>BP:</b> ? <b>Sol:</b> 0.08% <b>Fl.P.:</b> 420°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.10 <b>VP:</b> 0.0000006 mmHg <b>MLT:</b> 302°F <b>UEL:</b> NA <b>LEL:</b> NA Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed	

<b>Thioglycolic acid</b>	<b>Formula:</b> HSCH <sub>2</sub> COOH	<b>CAS#:</b> 68-11-1	<b>RTECS#:</b> AI5950000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.77 mg/m <sup>3</sup>	<b>DOT:</b> 1940 153			
<b>Synonyms/Trade Names:</b> Acetyl mercaptan, Mercaptoacetate, Mercaptoacetic acid, 2-Mercaptoacetic acid, 2-Thioglycolic acid, Thiovanic acid				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 ppm (4 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless liquid with a strong, disagreeable odor characteristic of mercaptans. [Note: Olfactory fatigue may occur after short exposures.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 92.1 <b>BP:</b> ? <b>Sol:</b> Miscible <b>Fl.P.:</b> >230°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.32 <b>VP(64°F):</b> 10 mmHg <b>FRZ:</b> 2°F <b>UEL:</b> ? <b>LEL:</b> 5.9% Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> Air, strong oxidizers, bases, active metals (e.g., sodium potassium, magnesium, calcium) [Note: Readily oxidized by air.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; lac, corn damage; skin burns, blisters; in animals: lass; gasping respirations; convuls <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Thionyl chloride</b>	<b>Formula:</b> SOCl <sub>2</sub>	<b>CAS#:</b> 7719-09-7	<b>RTECS#:</b> XM5150000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.87 mg/m <sup>3</sup>	<b>DOT:</b> 1836 137			
<b>Synonyms/Trade Names:</b> Sulfinyl chloride, Sulfur chloride oxide, Sulfurous dichloride, Sulfurous oxychloride, Thionyl dichloride				
<b>Exposure Limits:</b> NIOSH REL: C 1 ppm (5 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless to yellow to reddish liquid with a pungent odor like sulfur dioxide. [Note: Fumes form when exposed to moist air.]				
<b>Chemical &amp; Physical Properties:</b> MW: 119.0 BP: 169°F Sol: Reacts Fl.P: NA IP: ? Sp.Gr: 1.64 VP(70°F): 100 mmHg FRZ: -156°F UEL: NA LEL: NA Noncombustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Water, acids, alkalis, ammonia, chloryl perchlorate [Note: Reacts violently with water to form sulfur dioxide & hydrogen chloride.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; eye, skin burns TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Thiram</b>	<b>Formula:</b> C <sub>6</sub> H <sub>12</sub> N <sub>2</sub> S <sub>4</sub>	<b>CAS#:</b> 137-26-8	<b>RTECS#:</b> JO1400000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2771 151			
<b>Synonyms/Trade Names:</b> bis(Dimethylthiocarbamoyl) disulfide, Tetramethylthiuram disulfide				
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL: TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5005	
<b>Physical Description:</b> Colorless to yellow, crystalline solid with a characteristic odor. [Note: Commercial pesticide products may be dyed blue.]				
<b>Chemical &amp; Physical Properties:</b> MW: 240.4 BP: Decomposes Sol: 0.003% Fl.P: ? IP: ? Sp.Gr: 1.29 VP: 0.000008 mmHg MLT: 312°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 50 mg/m <sup>3</sup> ; CcrOv95*/Sa* 100 mg/m <sup>3</sup> ; Sa:Cf*/CcrFOv100/GmFOv100/ PapOvHie*/ScbaF/SaF §: ScbaF;Pd,Pp/SaF;Pd,Pp;Ascba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, oxidizable materials				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; dermat; Antabuse-like effects TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Tin</b>	<b>Formula:</b> Sn	<b>CAS#:</b> 7440-31-5	<b>RTECS#:</b> XP7320000	<b>IDLH:</b> 100 mg/m <sup>3</sup> (as Sn)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Metallic tin, Tin flake, Tin metal, Tin powder				
<b>Exposure Limits:</b> NIOSH REL*: TWA 2 mg/m <sup>3</sup> OSHA PEL*: TWA 2 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other inorganic tin compounds (as Sn) except tin oxides.]			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303 OSHA ID121, ID206	
<b>Physical Description:</b> Gray to almost silver-white, ductile, malleable, lustrous solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 118.7 BP: 4545°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 7.28 VP: 0 mmHg (approx) MLT: 449°F UEL: NA LEL: NA Noncombustible Solid, but powdered form may ignite.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 10 mg/m <sup>3</sup> : Qm* 20 mg/m <sup>3</sup> : 95XQ*/Sa* 50 mg/m <sup>3</sup> : Sa:Cf*/PaprHie* 100 mg/m <sup>3</sup> : 100F/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Chlorine, turpentine, acids, alkalis				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; in animals: vomit, diarr, para with musc twitch TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

<b>Tin (organic compounds, as Sn)</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> 25 mg/m <sup>3</sup> (as Sn)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific organic tin compound. [*Note: Also see specific listing for Cyhexatin.]				
<b>Exposure Limits:</b> NIOSH REL*: TWA 0.1 mg/m <sup>3</sup> [skin] [*Note: The REL applies to all organic tin compounds except Cyhexatin.] OSHA PEL*: TWA 0.1 mg/m <sup>3</sup> [*Note: The PEL applies to all organic tin compounds.]			<b>Measurement Methods (see Table 1):</b> NIOSH 5504	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific organic tin compound.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific organic tin compound.		<b>Personal Protection/Sanitation (see Table 2):</b> Recommendations regarding personal protective clothing vary depending upon the specific compound.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 1 mg/m <sup>3</sup> : CrOv95/Sa 2.5 mg/m <sup>3</sup> : Sa:Cf/PaprovHie 5 mg/m <sup>3</sup> : CrFOv100/GmFOv100/ PapTOvHie/SaT:Cf/ScbaF/SaF 25 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; head, dizz; psycho-neurologic dist; sore throat, cough; abdom pain, vomit; urine retention; paresis, focal anes; skin burns, pruritus; in animals: hemolysis; hepatic nec; kidney damage TO: Eyes, skin, resp sys, CNS, liver, kidneys, urinary tract, blood			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Tin(II) oxide (as Sn)</b>	<b>Formula:</b> SnO	<b>CAS#:</b> 21651-19-4	<b>RTECS#:</b> XQ3700000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Stannous oxide, Tin protoxide [Note: Also see specific listing for Tin(IV) oxide (as Sn).]				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303	
<b>Physical Description:</b> Brownish-black powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 134.7 BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 6.3 VP: 0 mmHg (approx) MLT(600 mmHg): 1976°F (Decomposes) UEL: NA LEL: NA	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Stannosis (benign pneumoconiosis): dysp, decr pulm func TO: Resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air		

<b>Tin(IV) oxide (as Sn)</b>	<b>Formula:</b> SnO <sub>2</sub>	<b>CAS#:</b> 18282-10-5	<b>RTECS#:</b> XQ4000000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Stannic dioxide, Stannic oxide, White tin oxide [Note: Also see specific listing for Tin(II) oxide (as Sn).]				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303	
<b>Physical Description:</b> White or slightly gray powder.				
<b>Chemical &amp; Physical Properties:</b> MW: 150.7 BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 6.95 VP: 0 mmHg (approx) MLT: 2966°F (Decomposes) UEL: NA LEL: NA	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.		
<b>Incompatibilities and Reactivities:</b> Chlorine trifluoride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Stannosis (benign pneumoconiosis): dysp, decr pulm func TO: Resp sys		<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air		

<b>Titanium dioxide</b>		<b>Formula:</b> TiO <sub>2</sub>	<b>CAS#:</b> 13463-67-7	<b>RTECS#:</b> XR2275000	<b>IDLH:</b> Ca [5000 mg/m <sup>3</sup> ]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Rutile, Titanium oxide, Titanium peroxide					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: TWA 15 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH S385 (II-3)	
<b>Physical Description:</b> White, odorless powder.					
<b>Chemical &amp; Physical Properties:</b> MW: 79.9 BP: 4532-5432°F Sol: Insoluble F.P.: NA IP: NA Sp.Gr: 4.26 VP: 0 mmHg (approx) MLT: 3326-3362°F UEL: NA LEL: NA Noncombustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Lung fib; [carc] TO: Resp sys [in animals: lung tumors]				<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>o-Tolidine</b>		<b>Formula:</b> C <sub>14</sub> H <sub>16</sub> N <sub>2</sub>	<b>CAS#:</b> 119-93-7	<b>RTECS#:</b> DD1225000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 4,4'-Diamino-3,3'-dimethylbiphenyl; Diaminoditolyol; 3,3'-Dimethylbenzidine; 3,3'-Dimethyl-4,4'-diphenyldiamine; 3,3'-Tolidine					
<b>Exposure Limits:</b> NIOSH REL: Ca C 0.02 mg/m <sup>3</sup> [60-minute] [skin] See Appendix A See Appendix C OSHA PEL: See Appendix C				<b>Measurement Methods (see Table 1):</b> NIOSH 5013 OSHA 71	
<b>Physical Description:</b> White to reddish crystals or powder. [Note: Darkens on exposure to air. Often used in paste or wet cake form. Used as a basis for many dyes.]					
<b>Chemical &amp; Physical Properties:</b> MW: 212.3 BP: 572°F Sol: 0.1% F.P.: ? IP: ? Sp.Gr: ? VP: ? MLT: 264°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose; in animals: liver, kidney damage; [carc] TO: Eyes, resp sys, liver, kidneys [in animals: liver, bladder & mammary gland tumors]				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Toluene</b>	<b>Formula:</b> C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	<b>CAS#:</b> 108-88-3	<b>RTECS#:</b> XS2520000	<b>IDLH:</b> 500 ppm
<b>Conversion:</b> 1 ppm = 3.77 mg/m <sup>3</sup>		<b>DOT:</b> 1294 130		
<b>Synonyms/Trade Names:</b> Methyl benzene, Methyl benzol, Phenyl methane, Toluol				
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (375 mg/m <sup>3</sup> ) ST 150 ppm (560 mg/m <sup>3</sup> ) OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)			<b>Measurement Methods</b> (see Table 1): NIOSH 1500, 1501, 3800, 4000 OSHA 111	
<b>Physical Description:</b> Colorless liquid with a sweet, pungent, benzene-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 92.1 BP: 232°F Sol(74°F): 0.07% Fl.P: 40°F IP: 8.82 eV Sp.Gr: 0.87 VP: 21 mmHg FRZ: -139°F UEL: 7.1% LEL: 1.1% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>500 ppm:</b> CcrOv*/PapOv*/ GmFOv/Sa*/ScbaF ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose; lass, conf, euph, dizz, head; dilated pupils, lac; anxi, musc ftg, insom; pares; derm; liver, kidney damage TO: Eyes, skin, resp sys, CNS, liver, kidneys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Toluenediamine</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>3</sub> (NH <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 25376-45-8 95-80-7 (2,4-TDA)	<b>RTECS#:</b> XS9445000 XS9625000 (2,4-TDA)	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 1709 151 (2,4-Toluenediamine)		
<b>Synonyms/Trade Names:</b> Diaminotoluene, Methylphenylene diamine, TDA, Toluenediamine isomers, Tolylenediamine [Note: Various isomers of TDA exist.]				
<b>Exposure Limits:</b> NIOSH REL: Ca (all isomers) See Appendix A OSHA PEL: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5516 OSHA 65	
<b>Physical Description:</b> Colorless to brown, needle-shaped crystals or powder. [Note: Tends to darken on storage and exposure to air. Properties given are for 2,4-TDA.]				
<b>Chemical &amp; Physical Properties:</b> MW: 122.2 BP: 558°F Sol: Soluble Fl.P: 300°F IP: ? Sp.Gr: 1.05 (Liquid at 212°F) VP(224°F): 1 mmHg MLT: 210°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ‡: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; derm; ataxia, tacar, nau, vomit, convuls, resp depres; methemo, cyan, head, lass, dizz, bluish skin; liver inj; [carc] TO: Eyes, skin, resp sys, blood, CVS, liver [in animals: liver, skin & mammary gland tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Toluene-2,4-diisocyanate</b>		<b>Formula:</b> CH <sub>2</sub> C <sub>6</sub> H <sub>3</sub> (NCO) <sub>2</sub>	<b>CAS#:</b> 584-84-9	<b>RTECS#:</b> CZ6300000	<b>IDLH:</b> Ca [2.5 ppm]
<b>Conversion:</b> 1 ppm = 7.13 mg/m <sup>3</sup>		<b>DOT:</b> 2078 156			
<b>Synonyms/Trade Names:</b> TDI; 2,4-TDI; 2,4-Toluene diisocyanate					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: C 0.02 ppm (0.14 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 2535, 5521, 5522, 5525 OSHA 18, 33, 42		
<b>Physical Description:</b> Colorless to pale-yellow solid or liquid (above 71°F) with a sharp, pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 174.2 BP: 484°F Sol: Insoluble F.I.P: 260°F IP: ? Sp.Gr: 1.22 VP(77°F): 0.01 mmHg MLT: 71°F UEL: 9.5% LEL: 0.9% Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF;Pd,Pp/SaF;Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, water, acids, bases & amines (may cause foam & spatter); alcohols [Note: Reacts slowly with water to form carbon dioxide and polyureas.]					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; choke, paroxysmal cough; chest pain, restler soreness; nau, vomit, abdom pain; bron, bronchospasm, pulm edema; dysp, asthma; conj, lac; derm, skin sens; [carc] TO: Eyes, skin, resp sys [in animals: pancreas, liver, mammary gland, circulatory sys & skin tumors]			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>m-Toluidine</b>		<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub>	<b>CAS#:</b> 108-44-1	<b>RTECS#:</b> XU2800000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1708 153			
<b>Synonyms/Trade Names:</b> 3-Amino-1-methylbenzene, 1-Aminophenylmethane, m-Aminotoluene, 3-Methylaniline, 3-Methylbenzenamine, 3-Toluidine, meta-Toluidine, m-Tolylamine					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 2002 OSHA 73		
<b>Physical Description:</b> Colorless to light-yellow liquid with an aromatic, amine-like odor. [Note: Used as a basis for many dyes.]					
<b>Chemical &amp; Physical Properties:</b> MW: 107.2 BP: 397°F Sol: 2% F.I.P: 187°F IP: 7.50 eV Sp.Gr: 0.999 VP(106°F): 1 mmHg FRZ: -23°F UEL: ? LEL: ? Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; derm; hema, methemo; cyan, nau, vomit, low BP, convuls; anemia, lass TO: Eyes, skin, blood, CVS			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>o-Toluidine</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub>	<b>CAS#:</b> 95-53-4	<b>RTECS#:</b> XU2975000	<b>IDLH:</b> Ca [50 ppm]
<b>Conversion:</b> 1 ppm = 4.38 mg/m <sup>3</sup>	<b>DOT:</b> 1708 153			
<b>Synonyms/Trade Names:</b> o-Aminotoluene, 2-Aminotoluene, 1-Methyl-2-aminobenzene, o-Methylaniline, 2-Methylaniline, ortho-Toluidine, o-Tolylamine				
<b>Exposure Limits:</b> NIOSH REL: Ca [skin] See Appendix A OSHA PEL: TWA 5 ppm (22 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 2002, 2017, 8317 OSHA 73	
<b>Physical Description:</b> Colorless to pale-yellow liquid with an aromatic, aniline-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 107.2 BP: 392°F Sol: 2% Fl.P: 185°F IP: 7.44 eV Sp.Gr: 1.01 VP: 0.3 mmHg FRZ: 6°F UEL: ? LEL: ? Class IIIA Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, nitric acid, bases				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes; anoxia, head, cyan; lass, dizz, drow; micro hema; eye burns; derm; [carc] TO: Eyes, skin, blood, kidneys, liver, CVS [bladder cancer]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>p-Toluidine</b>	<b>Formula:</b> CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub>	<b>CAS#:</b> 106-49-0	<b>RTECS#:</b> XU3150000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b> 1708 153			
<b>Synonyms/Trade Names:</b> 4-Aminotoluene, 4-Methylaniline, 4-Methylbenzenamine, 4-Toluidine, para-Toluidine, p-Tolylamine				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 2002 OSHA 73	
<b>Physical Description:</b> White solid with an aromatic odor. [Note: Used as a basis for many dyes.]				
<b>Chemical &amp; Physical Properties:</b> MW: 107.2 BP: 393°F Sol: 0.7% Fl.P: 188°F IP: 7.50 eV Sp.Gr: 1.05 VP(108°F): 1 mmHg MLT: 111°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench	<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers, acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; derm; hema, methemo; cyan, nau, vomit, low BP, convuls; anemia, lass; [carc] TO: Eyes, skin, blood, CVS [in animals: liver tumors]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Tributyl phosphate</b>	<b>Formula:</b> (CH <sub>3</sub> CH <sub>2</sub> ) <sub>3</sub> O <sub>3</sub> PO	<b>CAS#:</b> 126-73-8	<b>RTECS#:</b> TC7700000	<b>IDLH:</b> 30 ppm
<b>Conversion:</b> 1 ppm = 10.89 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Butyl phosphate, TBP, Tributyl ester of phosphoric acid, Tri-n-butyl phosphate				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.2 ppm (2.5 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> TWA 5 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): <b>NIOSH 5034</b>
<b>Physical Description:</b> Colorless to pale-yellow, odorless liquid.				
<b>Chemical &amp; Physical Properties:</b> MW: 266.3 BP: 552°F (Decomposes) Sol: 0.6% Fl.P(oc): 295°F IP: ? Sp.Gr: 0.98 VP(77°F): 0.004 mmHg FRZ: -112°F UEL: ? LEL: ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>2 ppm:</b> Sa <b>5 ppm:</b> Sa:Cf <b>10 ppm:</b> ScbaF/SaF <b>30 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Alkalis, oxidizers, water, moist air				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys, head; nau TO: Eyes, skin, resp sys			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Trichloroacetic acid</b>	<b>Formula:</b> CCl <sub>3</sub> COOH	<b>CAS#:</b> 76-03-9	<b>RTECS#:</b> AJ7875000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 6.68 mg/m <sup>3</sup>		<b>DOT:</b> 1839 153 (solid); 2564 153 (solution)		
<b>Synonyms/Trade Names:</b> TCA, Trichloroethanoic acid				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 ppm (7 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none				<b>Measurement Methods</b> (see Table 1): <b>OSHA PV2017</b>
<b>Physical Description:</b> Colorless to white, crystalline solid with a sharp, pungent odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 163.4 BP: 388°F Sol: Miscible Fl.P: NA IP: ? Sp.Gr: 1.62 VP(124°F): 1 mmHg MLT: 136°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Moisture, iron, zinc, aluminum, strong oxidizers [Note: Decomposes on heating to form phosgene & hydrogen chloride. Corrosive to metals.]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; cough, dysp, delayed pulm edema; eye, skin burns; derm; salv, vomit, diarr TO: Eyes, skin, resp sys, GI tract			<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1,2,4-Trichlorobenzene</b>	<b>Formula:</b> C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub>	<b>CAS#:</b> 120-82-1	<b>RTECS#:</b> DC2100000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.42 mg/m <sup>3</sup>		<b>DOT:</b> 2321 153 (liquid)		
<b>Synonyms/Trade Names:</b> unsym-Trichlorobenzene; 1,2,4-Trichlorobenzol				
<b>Exposure Limits:</b> NIOSH REL: C 5 ppm (40 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 5517	
<b>Physical Description:</b> Colorless liquid or crystalline solid (below 63°F) with an aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 181.4 BP: 416°F Sol: 0.003% F.I.P: 222°F IP: ? Sp.Gr: 1.45 VP: 1 mmHg FRZ: 63°F UEL(302°F): 6.6% LEL(302°F): 2.5% Class IIIB Combustible Liquid Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
	<b>Incompatibilities and Reactivities:</b> Acids, acid fumes, oxidizers, steam			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; in animals: liver, kidney damage; possible terato effects TO: Eyes, skin, resp sys, liver, repro sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1,1,2-Trichloroethane</b>	<b>Formula:</b> CHCl <sub>2</sub> CH <sub>2</sub> Cl	<b>CAS#:</b> 79-00-5	<b>RTECS#:</b> KJ3150000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 5.46 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Ethane trichloride, β-Trichloroethane, Vinyl trichloride				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 10 ppm (45 mg/m <sup>3</sup> ) [skin] See Appendix A See Appendix C (Chloroethanes) OSHA PEL: TWA 10 ppm (45 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 11	
<b>Physical Description:</b> Colorless liquid with a sweet, chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 133.4 BP: 237°F Sol: 0.4% F.I.P: ? IP: 11.00 eV Sp.Gr: 1.44 VP: 19 mmHg FRZ: -34°F UEL: 15.5% LEL: 6% Combustible Liquid, forms dense soot.	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF;Pd,Pp/SaF;Pd,Pp;AScba <b>Escape:</b> GmFOv/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Strong oxidizers & caustics; chemically-active metals (such as aluminum, magnesium powders, sodium & potassium)			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose; CNS depres; liver, kidney damage; derm; [carc] TO: Eyes, resp sys, CNS, liver, kidneys [in animals: liver cancer]		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Trichloroethylene</b>		<b>Formula:</b> ClCH=CCl <sub>2</sub>	<b>CAS#:</b> 79-01-6	<b>RTECS#:</b> KX4550000	<b>IDLH:</b> Ca [1000 ppm]
<b>Conversion:</b> 1 ppm = 5.37 mg/m <sup>3</sup>		<b>DOT:</b> 1710 160			
<b>Synonyms/Trade Names:</b> Ethylene trichloride, TCE, Trichloroethene, Triene					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca See Appendix A See Appendix C <b>OSHA PEL†:</b> TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 1022, 3800 <b>OSHA</b> 1001	
<b>Physical Description:</b> Colorless liquid (unless dyed blue) with a chloroform-like odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 131.4 <b>BP:</b> 189°F <b>Sol:</b> 0.1% <b>Fl.P.:</b> ? <b>IP:</b> 9.45 eV <b>Sp.Gr:</b> 1.46 <b>VP:</b> 58 mmHg <b>FRZ:</b> -99°F <b>UEL(77°F):</b> 10.5% <b>LEL(77°F):</b> 8% Combustible Liquid, but burns with difficulty.		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin; head, vis dist, lass, dizz, tremor, drow, nau, vomit; derm; card arrhy, pares; liver inj; [carc] <b>TO:</b> Eyes, skin, resp sys, heart, liver, kidneys, CNS [in animals: liver & kidney cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Trichloronaphthalene</b>		<b>Formula:</b> C <sub>10</sub> H <sub>5</sub> Cl <sub>3</sub>	<b>CAS#:</b> 1321-65-9	<b>RTECS#:</b> QK4025000	<b>IDLH:</b> See Appendix F
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Halowax®, Nibren wax, Seekay wax					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 5 mg/m <sup>3</sup> [skin] <b>OSHA PEL:</b> TWA 5 mg/m <sup>3</sup> [skin]				<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> S128 (II-2)	
<b>Physical Description:</b> Colorless to pale-yellow solid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 231.5 <b>BP:</b> 579-669°F <b>Sol:</b> Insoluble <b>Fl.P(oc):</b> 392°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.58 <b>VP:</b> <1 mmHg <b>MLT:</b> 199°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>50 mg/m<sup>3</sup>:</b> ScbaF/SaF <b>‡:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE  <b>See Appendix F</b>	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Anor, nau, dizz; jaun, liver inj <b>TO:</b> Liver			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1,2,3-Trichloropropane</b>	<b>Formula:</b> CH <sub>2</sub> ClCHClCH <sub>2</sub> Cl	<b>CAS#:</b> 96-18-4	<b>RTECS#:</b> TZ9275000	<b>IDLH:</b> Ca [100 ppm]
<b>Conversion:</b> 1 ppm = 6.03 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Allyl trichloride, Glycerol trichlorohydrin, Glyceryl trichlorohydrin, Trichlorohydrin				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 10 ppm (60 mg/m <sup>3</sup> ) [skin] See Appendix A OSHA PEL†: TWA 50 ppm (300 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1003 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a chloroform-like odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 147.4 BP: 314°F Sol: 0.1% Fl.P: 160°F IP: ? Sp.Gr: 1.39 VP: 3 mmHg FRZ: 6°F UEL(302°F): 12.6% LEL(248°F): 3.2% Class IIIA Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Chemically-active metals, strong caustics & oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose, throat; CNS depres; in animals: liver, kidney inj; [carc] TO: Eyes, skin, resp sys, CNS, liver, kidneys [in animals: forestomach, liver & mammary gland cancer]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>Formula:</b> CCl <sub>2</sub> FCClF <sub>2</sub>	<b>CAS#:</b> 76-13-1	<b>RTECS#:</b> KJ4000000	<b>IDLH:</b> 2000 ppm
<b>Conversion:</b> 1 ppm = 7.67 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Chlorofluorocarbon-113, CFC-113, Freon® 113, Genetron® 113, Halocarbon 113, Refrigerant 113, TTE				
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (7600 mg/m <sup>3</sup> ) ST 1250 ppm (9500 mg/m <sup>3</sup> ) OSHA PEL†: TWA 1000 ppm (7600 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1020 OSHA 113	
<b>Physical Description:</b> Colorless to water-white liquid with an odor like carbon tetrachloride at high concentrations. [Note: A gas above 118°F.]				
<b>Chemical &amp; Physical Properties:</b> MW: 187.4 BP: 118°F Sol(77°F): 0.02% Fl.P: ? IP: 11.99 eV Sp.Gr(77°F): 1.56 VP: 285 mmHg FRZ: -31°F UEL: ? LEL: ? Noncombustible Liquid at ordinary temperatures, but the gas will ignite and burn weakly at 1256°F.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>2000 ppm:</b> Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Chemically-active metals such as calcium, powdered aluminum, zinc, magnesium & beryllium [Note: Decomposes if in contact with alloys containing >2% magnesium.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit skin, throat, drow, dermat; CNS depres; in animals: card arrhy, narco TO: Skin, heart, CNS, CVS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Triethylamine</b>		<b>Formula:</b> (C <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> N	<b>CAS#:</b> 121-44-8	<b>RTECS#:</b> YE0175000	<b>IDLH:</b> 200 ppm
<b>Conversion:</b> 1 ppm = 4.14 mg/m <sup>3</sup>		<b>DOT:</b> 1296 132			
<b>Synonyms/Trade Names:</b> TEA					
<b>Exposure Limits:</b> NIOSH REL: See Appendix D OSHA PEL†: TWA 25 ppm (100 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH S152 (II-3) OSHA PV2060	
<b>Physical Description:</b> Colorless liquid with a strong, ammonia-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 101.2 BP: 193°F Sol: 2% FLP: 20°F IP: 7.50 eV Sp.Gr: 0.73 VP: 54 mmHg FRZ: -175°F UEL: 8.0% LEL: 1.2% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (>1%) Quick drench (>1%)		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>OSHA</b> <b>200 ppm:</b> Sa:CfE/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFS/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids, chlorine, hypochlorite, halogenated compounds					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, resp sys; in animals: myocardial, kidney, liver damage TO: Eyes, skin, resp sys, CVS, liver, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Trifluorobromomethane</b>		<b>Formula:</b> CBrF <sub>3</sub>	<b>CAS#:</b> 75-63-8	<b>RTECS#:</b> PA6425000	<b>IDLH:</b> 40,000 ppm
<b>Conversion:</b> 1 ppm = 6.09 mg/m <sup>3</sup>		<b>DOT:</b> 1009 126			
<b>Synonyms/Trade Names:</b> Bromotrifluoromethane, Fluorocarbon 1301, Freon® 13B1, Halocarbon 13B1, Halon® 1301, Monobromotrifluoromethane, Refrigerant 13B1, Trifluoromonobromomethane					
<b>Exposure Limits:</b> NIOSH REL: TWA 1000 ppm (6100 mg/m <sup>3</sup> ) OSHA PEL: TWA 1000 ppm (6100 mg/m <sup>3</sup> )				<b>Measurement Methods</b> (see Table 1): NIOSH 1017	
<b>Physical Description:</b> Colorless, odorless gas. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 148.9 BP: -72°F Sol: 0.03% FLP: NA IP: 11.78 eV RGasD: 5.14 VP: >1 atm FRZ: -267°F UEL: NA LEL: NA Nonflammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>10,000 ppm:</b> Sa <b>25,000 ppm:</b> Sa:Cf <b>40,000 ppm:</b> SaT:Cf/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Chemically-active metals (such as calcium, powdered aluminum, zinc, and magnesium)					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Dizz; card arrhy; liquid: frostbite TO: CNS, heart				<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Trimellitic anhydride</b>	<b>Formula:</b> C <sub>9</sub> H <sub>4</sub> O <sub>5</sub>	<b>CAS#:</b> 552-30-7	<b>RTECS#:</b> DC2050000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.86 mg/m <sup>3</sup>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,2,4-Benzenetricarboxylic anhydride; 4-Carboxyphthalic anhydride; TMA; TMAN; Trimellitic acid anhydride [ <b>Note:</b> TMA is also a synonym for Trimethylamine.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 0.005 ppm (0.04 mg/m <sup>3</sup> ) Should be handled in the workplace as an extremely toxic substance. <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>NIOSH 5036</b> <b>OSHA 98</b>	
<b>Physical Description:</b> Colorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 192.1 BP: ? Sol: ? Fl.P: NA IP: ? Sp.Gr: ? VP: 0.000004 mmHg MLT: 322°F UEL: NA LEL: NA Combustible Solid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, resp sys; pulm edema, resp sens; rhinitis, asthma, cough, wheez, dysp, mal, fever, musc aches, sneez <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Trimethylamine</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>3</sub> N	<b>CAS#:</b> 75-50-3	<b>RTECS#:</b> PA0350000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.42 mg/m <sup>3</sup>	<b>DOT:</b> 1083 118 (anhydrous); 1297 132 (aqueous solution)			
<b>Synonyms/Trade Names:</b> N,N-Dimethylmethanamine; TMA [ <b>Note:</b> May be used in an aqueous solution (typically 25%, 30%, or 40% TMA).]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 10 ppm (24 mg/m <sup>3</sup> ) ST 15 ppm (36 mg/m <sup>3</sup> ) <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>OSHA PV2060</b>	
<b>Physical Description:</b> Colorless gas with a fishy, amine odor. [ <b>Note:</b> A liquid below 37°F. Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> MW: 59.1 BP: 37°F Sol(86°F): 48% Fl.P: NA (Gas) 20°F (Liquid) IP: 7.82 eV RGasD: 2.09 VP(70°F): 1454 mmHg FRZ: -179°F UEL: 11.6% LEL: 2.0% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact (liquid/solution) Frostbite <b>Eyes:</b> Prevent eye contact (liquid/solution) Frostbite <b>Wash skin:</b> When contam (solution) <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash (liquid/solution) Quick drench (liquid/solution) Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (including bromine), ethylene oxide, nitrosating agents (e.g., sodium nitrite), mercury, strong acids [ <b>Note:</b> Corrosive to many metals (e.g., zinc, brass, aluminum, copper).]				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing (solution), Con <b>SY:</b> Irrit eyes, skin, nose, throat, resp sys; cough, dysp, delayed pulm edema; blurred vision, corn nec; skin burns; liquid: frostbite <b>TO:</b> Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed (liquid/solution)/Frostbite <b>Skin:</b> Water flush immed (liquid/solution)/Frostbite <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed (solution)	

<b>1,2,3-Trimethylbenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>3</sub> (CH <sub>3</sub> ) <sub>3</sub>	<b>CAS#:</b> 526-73-8	<b>RTECS#:</b> DC3300000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.92 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Hemellitrol [ <b>Note:</b> Hemimellitene is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (125 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA PV2091	
<b>Physical Description:</b> Clear, colorless liquid with a distinctive, aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 120.2 BP: 349°F Sol: Low F.I.P.: ? IP: 8.48 eV Sp.Gr: 0.89 VP(62°F): 1 mmHg FRZ: -14°F UEL: 6.6% LEL: 0.8% Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, nitric acid					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; bron; hypochromic anemia; head, drow, lass, dizz, nau, inco; vomit, conf; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS, blood				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1,2,4-Trimethylbenzene</b>		<b>Formula:</b> C <sub>6</sub> H <sub>3</sub> (CH <sub>3</sub> ) <sub>3</sub>	<b>CAS#:</b> 95-63-6	<b>RTECS#:</b> DC3325000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.92 mg/m <sup>3</sup>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Asymmetrical trimethylbenzene, psi-Cumene, Pseudocumene [ <b>Note:</b> Hemimellitene is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer.]					
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (125 mg/m <sup>3</sup> ) OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): OSHA PV2091	
<b>Physical Description:</b> Clear, colorless liquid with a distinctive, aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 120.2 BP: 337°F Sol: 0.006% F.I.P.: 112°F IP: 8.27 eV Sp.Gr: 0.88 VP(56°F): 1 mmHg FRZ: -77°F UEL: 6.4% LEL: 0.9% Class II Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, nitric acid					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; bron; hypochromic anemia; head, drow, lass, dizz, nau, inco; vomit, conf; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS, blood				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>1,3,5-Trimethylbenzene</b>	<b>Formula:</b> C <sub>6</sub> H <sub>3</sub> (CH <sub>3</sub> ) <sub>3</sub>	<b>CAS#:</b> 108-67-8	<b>RTECS#:</b> OX6825000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 4.92 mg/m <sup>3</sup>		<b>DOT:</b> 2325 129		
<b>Synonyms/Trade Names:</b> Mesitylene, Symmetrical trimethylbenzene, sym-Trimethylbenzene				
<b>Exposure Limits:</b> NIOSH REL: TWA 25 ppm (125 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): OSHA PV2091	
<b>Physical Description:</b> Clear, colorless liquid with a distinctive, aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 120.2 BP: 329°F Sol: 0.002% Fl.P: 122°F IP: 8.39 eV Sp.Gr: 0.86 VP: 2 mmHg FRZ: -49°F UEL: ? LEL: ? Class II Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Oxidizers, nitric acid				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, resp sys; bron; hypochromic anemia; head, drow, lass, dizz, nau, inco; vomit, conf; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS, blood			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Trimethyl phosphite</b>	<b>Formula:</b> (CH <sub>3</sub> O) <sub>3</sub> P	<b>CAS#:</b> 121-45-9	<b>RTECS#:</b> TH1400000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 5.08 mg/m <sup>3</sup>		<b>DOT:</b> 2329 129		
<b>Synonyms/Trade Names:</b> Methyl phosphite, Trimethoxyphosphine, Trimethyl ester of phosphorous acid				
<b>Exposure Limits:</b> NIOSH REL: TWA 2 ppm (10 mg/m <sup>3</sup> ) OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless liquid with a distinctive, pungent odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 124.1 BP: 232°F Sol: Reacts Fl.P: 82°F IP: ? Sp.Gr: 1.05 VP(77°F): 24 mmHg FRZ: -108°F UEL: ? LEL: ? Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.	
<b>Incompatibilities and Reactivities:</b> Magnesium perchlorate, water [Note: Reacts (hydrolyzes) with water.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; derm; in animals: terato effects TO: Eyes, skin, resp sys, repro sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>2,4,6-Trinitrotoluene</b>		<b>Formula:</b> CH <sub>2</sub> C <sub>6</sub> H <sub>2</sub> (NO <sub>2</sub> ) <sub>3</sub>	<b>CAS#:</b> 118-96-7	<b>RTECS#:</b> XU0175000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1356 113 (wet)			
<b>Synonyms/Trade Names:</b> 1-Methyl-2,4,6-trinitrobenzene; TNT; Trinitrotoluene; sym-Trinitrotoluene; Trinitrotoluol					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.5 mg/m <sup>3</sup> [skin] OSHA PEL†: TWA 1.5 mg/m <sup>3</sup> [skin]				<b>Measurement Methods (see Table 1):</b> OSHA 44	
<b>Physical Description:</b> Colorless to pale-yellow, odorless solid or crushed flakes.					
<b>Chemical &amp; Physical Properties:</b> MW: 227.1 BP: 464°F (Explodes) Sol(77°F): 0.01% FLP: ? (Explodes) IP: 10.59 eV Sp.Gr: 1.65 VP: 0.0002 mmHg MLT: 176°F UEL: ? LEL: ? Combustible Solid (Class A Explosive)		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> 5 mg/m <sup>3</sup> : Sa* 12.5 mg/m <sup>3</sup> : Sa:Cf* 25 mg/m <sup>3</sup> : ScbaF/SaF 500 mg/m <sup>3</sup> : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv100/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, ammonia, strong alkalis, combustible materials, heat [Note: Rapid heating will result in detonation.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit skin, muc memb; liver damage, jaun; cyan; sneez; cough, sore throat; peri neur, musc pain; kidney damage; cataract; sens derm; leucyt; anemia; card irreg TO: Eyes, skin, resp sys, blood, liver, CVS, CNS, kidneys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Triorthocresyl phosphate</b>		<b>Formula:</b> (CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> O) <sub>3</sub> PO	<b>CAS#:</b> 78-30-8	<b>RTECS#:</b> TD0350000	<b>IDLH:</b> 40 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 2574 151			
<b>Synonyms/Trade Names:</b> TCP, TOCP, Tri-o-cresyl ester of phosphoric acid, Tri-o-cresyl phosphate					
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> [skin] OSHA PEL†: TWA 0.1 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 5037	
<b>Physical Description:</b> Colorless to pale-yellow, odorless liquid or solid (below 52°F).					
<b>Chemical &amp; Physical Properties:</b> MW: 368.4 BP: 770°F (Decomposes) Sol: Slight FLP: 437°F IP: ? Sp.Gr: 1.20 VP(77°F): 0.00002 mmHg FRZ: 52°F UEL: ? LEL: ? Class IIIB Combustible Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> N.R. <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> 0.5 mg/m <sup>3</sup> : Qm 1 mg/m <sup>3</sup> : 95XQ/Sa 2.5 mg/m <sup>3</sup> : Sa:Cf/PaprHie 5 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 40 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: GI dist; peri neur; cramps in calves, pares in feet or hands; weak feet, wrist drop, para TO: PNS, CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Triphenylamine</b>		<b>Formula:</b> (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> N	<b>CAS#:</b> 603-34-9	<b>RTECS#:</b> YK2680000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> N,N-Diphenylaniline; N,N-Diphenylbenzenamine					
<b>Exposure Limits:</b> NIOSH REL: TWA 5 mg/m <sup>3</sup> OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Colorless solid.					
<b>Chemical &amp; Physical Properties:</b> MW: 245.3 BP: 689°F Sol: Insoluble Fl.P: ? IP: 7.60 eV Sp.Gr: 0.77 VP: ? MLT: 261°F UEL: ? LEL: ?		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: N.R. Change: Daily		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: In animals: irrit skin TO: Skin			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

<b>Triphenyl phosphate</b>		<b>Formula:</b> (C <sub>6</sub> H <sub>5</sub> O) <sub>3</sub> PO	<b>CAS#:</b> 115-86-6	<b>RTECS#:</b> TC8400000	<b>IDLH:</b> 1000 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Phenyl phosphate, TPP, Triphenyl ester of phosphoric acid					
<b>Exposure Limits:</b> NIOSH REL: TWA 3 mg/m <sup>3</sup> OSHA PEL: TWA 3 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> NIOSH 5038	
<b>Physical Description:</b> Colorless, crystalline powder with a phenol-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 326.3 BP: 776°F Sol(129°F): 0.002% Fl.P: 428°F IP: ? Sp.Gr: 1.29 VP(380°F): 1 mmHg MLT: 120°F UEL: ? LEL: ? Combustible Solid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 15 mg/m <sup>3</sup> : Qm 30 mg/m <sup>3</sup> : 95XQ/Sa 75 mg/m <sup>3</sup> : Sa:Cf/PapRHe 150 mg/m <sup>3</sup> : 100F/SaT:Cf/PapRTHie/ ScbaF/SaF 1000 mg/m <sup>3</sup> : Sa:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScBa Escape: 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing SY: Minor changes in blood enzymes; in animals: musc weak, para TO: Blood, PNS			<b>First Aid (see Table 6):</b> Breath: Resp support Swallow: Medical attention immed		

<b>Tungsten</b>	<b>Formula:</b> W	<b>CAS#:</b> 7440-33-7	<b>RTECS#:</b> YO7175000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Tungsten metal, Wolfram				
<b>Exposure Limits:</b> NIOSH REL*: TWA 5 mg/m <sup>3</sup> ST 10 mg/m <sup>3</sup> [*Note: The REL also applies to other insoluble tungsten compounds (as W).] OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 7074, 7300, 7301 OSHA ID213	
<b>Physical Description:</b> Hard, brittle, steel-gray to tin-white solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 183.9 BP: 10,701°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 19.3 VP: 0 mmHg (approx) MLT: 6170°F UEL: NA LEL: NA Combustible in the form of finely divided powder; may ignite spontaneously.		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 50 mg/m <sup>3</sup> : 100XQ/Sa/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100XQ/ScbaE
<b>Incompatibilities and Reactivities:</b> Bromine trifluoride, chlorine trifluoride, fluorine, iodine pentafluoride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; diffuse pulm fib; loss of appetite, nau, cough; blood changes TO: Eyes, skin, resp sys, blood			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air Swallow: Medical attention immed	

<b>Tungsten (soluble compounds, as W)</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific soluble tungsten compound.				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> ST 3 mg/m <sup>3</sup> OSHA PEL†: none			<b>Measurement Methods (see Table 1):</b> NIOSH 7074, 7300, 7301 OSHA ID213	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble tungsten compound.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble tungsten compound.		<b>Personal Protection/Sanitation (see Table 2):</b> Recommendations regarding personal protective clothing vary depending upon the specific compound.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH 10 mg/m <sup>3</sup> : 100XQ/Sa 25 mg/m <sup>3</sup> : Sa:Cf 50 mg/m <sup>3</sup> : 100F/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, resp sys; in animals: CNS disturbances; diarr; resp failure; behavioral, body weight, blood changes TO: Eyes, skin, resp sys, CNS, GI tract			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Water wash Breath: Resp support Swallow: Medical attention immed	

<b>Tungsten carbide (cemented)</b>	<b>Formula:</b> WC/Co/Ni/Ti	<b>CAS#:</b> 1: 11107-01-0 2: 12718-69-3 3: 37329-49-0	<b>RTECS#:</b> 1: YO7350000 2: YO7525000 3: YO7700000	<b>IDLH:</b> N.D.
	<b>Conversion:</b>	<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Cemented tungsten carbide, Cemented WC, Hard metal <b>[Note:</b> The tungsten carbide (WC) content is generally 85-95% & the cobalt content is generally 5-15%.] [1: 85% WC, 15% Co; 2: 92% WC, 8% Co; 3: 78% WC, 14% Co, 8% Ti]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> See Appendix C <b>OSHA PEL†:</b> See Appendix C			<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> A mixture of tungsten carbide, cobalt, and sometimes other metals & metal oxides or carbides.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific mixture.	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily (Ni) <b>Remove:</b> When wet or contam <b>Change:</b> Daily	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>0.25 mg Co/m<sup>3</sup>:</b> Qm <b>0.5 mg Co/m<sup>3</sup>:</b> 95XQ*/Sa* <b>1.25 mg Co/m<sup>3</sup>:</b> Sa:Cf*/Pap/Hie*/Pap/Hie* <b>2.5 mg Co/m<sup>3</sup>:</b> 100F/ScbaF/SaF <b>20 mg Co/m<sup>3</sup>:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
		<b>Tungsten carbide (cemented) containing Nickel:</b> <b>NIOSH</b> ‡:ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Tungsten carbide: Fluorine, chlorine trifluoride, oxides of nitrogen, lead dioxide				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; possible skin sens to cobalt, nickel; diffuse pulm fib; loss of appetite, nau, cough; blood changes <b>TO:</b> Eyes, skin, resp sys, blood		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Fresh air <b>Swallow:</b> Medical attention immed		

<b>Turpentine</b>	<b>Formula:</b> C <sub>10</sub> H <sub>16</sub> (approx)	<b>CAS#:</b> 8006-64-2	<b>RTECS#:</b> YO8400000	<b>IDLH:</b> 800 ppm
	<b>Conversion:</b> 1 ppm = 5.56 mg/m <sup>3</sup> (approx)	<b>DOT:</b> 1299 128		
<b>Synonyms/Trade Names:</b> Gumsprits, Gum turpentine, Spirits of turpentine, Steam distilled turpentine, Sulfate wood turpentine, Turps, Wood turpentine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 100 ppm (560 mg/m <sup>3</sup> ) <b>OSHA PEL:</b> TWA 100 ppm (560 mg/m <sup>3</sup> )			<b>Measurement Methods (see Table 1):</b> NIOSH 1551	
<b>Physical Description:</b> Colorless liquid with a characteristic odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 136 (approx) <b>BP:</b> 309-338°F <b>Sol:</b> Insoluble <b>F.L.P.:</b> 95°F <b>IP:</b> ? <b>Sp.Gr:</b> 0.86 <b>VP:</b> 4 mmHg <b>FRZ:</b> -58 to -76°F <b>UEL:</b> ? <b>LEL:</b> 0.8% Class IC Flammable Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>800 ppm:</b> Sa:Cf£/Pap/Ov£/CcrFOV/ GmFOV/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE		
		<b>Incompatibilities and Reactivities:</b> Strong oxidizers, chlorine, chromic anhydride, stannic chloride, chromyl chloride		
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat; head, dizz, convuls; skin sens; hema, prot; kidney damage; abdom pain, nau, vomit, diarr; chemical pneu (aspir liquid) <b>TO:</b> Eyes, skin, resp sys, CNS, kidneys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>1-Undecanethiol</b>		<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>10</sub> SH	<b>CAS#:</b> 5332-52-5	<b>RTECS#:</b>	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 7.71 mg/m <sup>3</sup>		<b>DOT:</b> 1228 131			
<b>Synonyms/Trade Names:</b> Undecyl mercaptan					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 0.5 ppm (3.9 mg/m <sup>3</sup> ) [15-minute] <b>OSHA PEL:</b> none				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Liquid.					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 188.4 <b>BP:</b> 495°F <b>Sol:</b> Insoluble <b>FLP:</b> ? <b>IP:</b> ? <b>Sp.Gr:</b> 0.84 <b>VP:</b> ? <b>FRZ:</b> 27°F <b>UEL:</b> ? <b>LEL:</b> ? Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>5 ppm:</b> CcrOv/Sa <b>12.5 ppm:</b> Sa:Cf/Pap/Ov <b>25 ppm:</b> CcrFOv/GmFOv/PapTOv/ ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, reducing agents, strong acids & bases, alkali metals					
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Irrit eyes, skin, resp sys; conf, dizz, head, drow, nau, vomit, lass, convuls <b>TO:</b> Eyes, skin, resp sys, CNS				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Uranium (insoluble compounds, as U)</b>		<b>Formula:</b> U (metal)	<b>CAS#:</b> 7440-61-1 (metal)	<b>RTECS#:</b> YR3490000 (metal)	<b>IDLH:</b> Ca [10 mg/m <sup>3</sup> (as U)]
<b>Conversion:</b>		<b>DOT:</b> 2979 162 (metal, pyrophoric)			
<b>Synonyms/Trade Names:</b> Uranium metal; Uranium I Synonyms of other insoluble uranium compounds vary depending upon the specific compound.					
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 0.2 mg/m <sup>3</sup> ST 0.6 mg/m <sup>3</sup> See Appendix A <b>OSHA PEL†:</b> TWA 0.25 mg/m <sup>3</sup>				<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Metal: Silver-white, malleable, ductile, lustrous solid. [Note: Weakly radioactive.]					
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 238.0 <b>BP:</b> 6895°F <b>Sol:</b> Insoluble <b>FLP:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 19.05 (metal) <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 2097°F <b>UEL:</b> NA <b>LEL:</b> NA <b>MEC:</b> 60 g/m <sup>3</sup> Metal: Combustible Solid, especially turnings and powder.		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE	
		<b>Incompatibilities and Reactivities:</b> Carbon dioxide, carbon tetrachloride, nitric acid, fluorine [Note: Complete coverage of uranium metal scrap with oil is essential for prevention of fire.]			
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): <b>ER:</b> Inh, Ing, Con <b>SY:</b> Derm; kidney damage; blood changes; [carc]; in animals: lung, lymph node damage; [carc] Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g., radon). <b>TO:</b> Skin, kidneys, bone marrow, lymphatic sys [lung cancer]				<b>First Aid</b> (see Table 6): <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Uranium (soluble compounds, as U)</b>		<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b>	<b>IDLH:</b> Ca [10 mg/m <sup>3</sup> (as U)]
<b>Conversion:</b>		<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific soluble uranium compound.					
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 0.05 mg/m <sup>3</sup> See Appendix A OSHA PEL: TWA 0.05 mg/m <sup>3</sup>				<b>Measurement Methods (see Table 1):</b> None available	
<b>Physical Description:</b> Appearance and odor vary depending upon the specific soluble uranium compound.					
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific soluble uranium compound.		<b>Personal Protection/Sanitization (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam/Daily <b>Remove:</b> When wet or contam <b>Change:</b> Daily <b>Provide:</b> Eyewash (UF <sub>6</sub> ), Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape (Halides):</b> GmFag100/ScbaE <b>Escape (Non-halides):</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Uranyl nitrate: combustibles; Uranium hexafluoride: water					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Lac, conj; short breath, cough, chest rales; nau, vomit; skin burns; RBC, casts in urine; prot; high BUN; [carc] Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g., radon). <b>TO:</b> Resp sys, blood, liver, kidneys, lymphatic sys, skin, bone marrow [lung cancer]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>n-Valeraldehyde</b>		<b>Formula:</b> CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> CHO	<b>CAS#:</b> 110-62-3	<b>RTECS#:</b> YV3600000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.53 mg/m <sup>3</sup>		<b>DOT:</b> 2058 129			
<b>Synonyms/Trade Names:</b> Amyl aldehyde, Pentanal, Valeral, Valeraldehyde, Valeric aldehyde					
<b>Exposure Limits:</b> NIOSH REL: TWA 50 ppm (175 mg/m <sup>3</sup> ) See Appendix C (Aldehydes) OSHA PEL†: none				<b>Measurement Methods (see Table 1):</b> NIOSH 2018, 2536 OSHA 85	
<b>Physical Description:</b> Colorless liquid with a strong, acrid, pungent odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 86.2 BP: 217°F Sol: Slight Fl.P: 54°F IP: 9.82 eV Sp.Gr: 0.81 VP: 26 mmHg FRZ: -133°F UEL: ? LEL: ? Class IB Flammable Liquid		<b>Personal Protection/Sanitization (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, nose, throat <b>TO:</b> Eyes, skin, resp sys				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Vanadium dust</b>	<b>Formula:</b> V <sub>2</sub> O <sub>5</sub>	<b>CAS#:</b> 1314-62-1	<b>RTECS#:</b> YW2450000	<b>IDLH:</b> 35 mg/m <sup>3</sup> (as V)
<b>Conversion:</b>	<b>DOT:</b> 2862 151			
<b>Synonyms/Trade Names:</b> Divanadium pentoxide dust, Vanadic anhydride dust, Vanadium oxide dust, Vanadium pentaoxide dust. Other synonyms vary depending upon the specific vanadium compound.				
<b>Exposure Limits:</b> <b>NIOSH REL*:</b> C 0.05 mg V/m <sup>3</sup> [15-minute] [*Note: The REL applies to all vanadium compounds except Vanadium metal and Vanadium carbide (see Ferrovandium dust).] <b>OSHA PEL†:</b> C 0.5 mg V <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7300, 7301, 7303, 7504, 9102 <b>OSHA</b> ID185	
<b>Physical Description:</b> Yellow-orange powder or dark-gray, odorless flakes dispersed in air.				
<b>Chemical &amp; Physical Properties:</b> MW: 181.9 BP: 3182°F (Decomposes) Sol: 0.8% F.L.P: NA IP: NA Sp.Gr: 3.36 VP: 0 mmHg (approx) MLT: 1274°F UEL: NA LEL: NA Noncombustible Solid, but may increase intensity of fire when in contact with combustible materials.	<b>Personal Protection/Sanititation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> (as V) <b>0.5 mg/m<sup>3</sup>:</b> 100XQ*/Sa* <b>1.25 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie* <b>2.5 mg/m<sup>3</sup>:</b> 100F/PaprTHie*/ScbaF/SaF <b>35 mg/m<sup>3</sup>:</b> SaF:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Lithium, chlorine trifluoride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Ing, Con <b>SY:</b> Irrit eyes, skin, throat; green tongue, metallic taste, eczema; cough; fine rales, wheez, bron, dysp <b>TO:</b> Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Vanadium fume</b>	<b>Formula:</b> V <sub>2</sub> O <sub>5</sub>	<b>CAS#:</b> 1314-62-1	<b>RTECS#:</b> YW2460000	<b>IDLH:</b> 35 mg/m <sup>3</sup> (as V)
<b>Conversion:</b>	<b>DOT:</b> 2862 151			
<b>Synonyms/Trade Names:</b> Divanadium pentoxide fume, Vanadic anhydride fume, Vanadium oxide fume, Vanadium pentaoxide fume. Other synonyms vary depending upon the specific vanadium compound.				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 0.05 mg V/m <sup>3</sup> [15-minute] <b>OSHA PEL†:</b> C 0.1 mg V <sub>2</sub> O <sub>5</sub> /m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7300, 7301, 7303, 7504 <b>OSHA</b> ID185	
<b>Physical Description:</b> Finely divided particulate dispersed in air.				
<b>Chemical &amp; Physical Properties:</b> MW: 181.9 BP: 3182°F (Decomposes) Sol: 0.8% F.L.P: NA IP: NA Sp.Gr: 3.36 VP: 0 mmHg (approx) MLT: 1274°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanititation (see Table 2):</b> <b>Skin:</b> N.R. <b>Eyes:</b> N.R. <b>Wash skin:</b> N.R. <b>Remove:</b> N.R. <b>Change:</b> N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> (as V) <b>0.5 mg/m<sup>3</sup>:</b> 100XQ*/Sa* <b>1.25 mg/m<sup>3</sup>:</b> Sa:C*/PaprHie* <b>2.5 mg/m<sup>3</sup>:</b> 100F/PaprTHie*/ScbaF/SaF <b>35 mg/m<sup>3</sup>:</b> SaF:Pd,Pp ‡: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Lithium, chlorine trifluoride				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Irrit eyes, throat; green tongue, metallic taste; cough, fine rales, wheez, bron, dysp; eczema <b>TO:</b> Eyes, skin, resp sys		<b>First Aid (see Table 6):</b> <b>Breath:</b> Resp support		

<b>Vegetable oil mist</b>	<b>Formula:</b>	<b>CAS#:</b> 68956-68-3	<b>RTECS#:</b> YX1850000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Vegetable mist				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp) OSHA PEL: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500, 0600	
<b>Physical Description:</b> An oil extracted from the seeds, fruit, or nuts of vegetables or other plant matter.				
<b>Chemical &amp; Physical Properties:</b> MW: varies BP: ? Sol: Insoluble Fl.P: 323-540°F IP: ? Sp.Gr: 0.91-0.95 VP: ? FRZ: ? UEL: ? LEL: ? Combustible Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): Not available.
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, resp sys; lac TO: Eyes, skin, resp sys Determine based on working conditions			<b>First Aid (see Table 6):</b> Eye: Irr immed Breath: Fresh air	

<b>Vinyl acetate</b>	<b>Formula:</b> CH <sub>2</sub> =CHOOCCH <sub>3</sub>	<b>CAS#:</b> 108-05-4	<b>RTECS#:</b> AK0875000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 3.52 mg/m <sup>3</sup>	<b>DOT:</b> 1301 129P			
<b>Synonyms/Trade Names:</b> 1-Acetoxyethylene, Ethenyl acetate, Ethenyl ethanoate, VAC, Vinyl acetate monomer, Vinyl ethanoate				
<b>Exposure Limits:</b> NIOSH REL: C 4 ppm (15 mg/m <sup>3</sup> ) [15-minute] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 1453 OSHA 51	
<b>Physical Description:</b> Colorless liquid with a pleasant, fruity odor. [Note: Raw material for many polyvinyl resins.]				
<b>Chemical &amp; Physical Properties:</b> MW: 86.1 BP: 162°F Sol: 2% Fl.P: 18°F IP: 9.19 eV Sp.Gr: 0.93 VP: 83 mmHg FRZ: -136°F UEL: 13.4% LEL: 2.6% Class IB Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH 40 ppm: CcrOv*/Sa* 100 ppm: Sa:Cf*/PaprOv* 200 ppm: CcrFOv/GmFOv/PaprTOv*/ ScbaF/SaF 4000 ppm: Sa:Pd,Pp* §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE
<b>Incompatibilities and Reactivities:</b> Acids, bases, silica gel, alumina, oxidizers, azo compounds, ozone [Note: Usually contains a stabilizer (e.g., hydroquinone or diphenylamine) to prevent polymerization.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; hoarseness, cough; loss of smell; eye burns, skin blisters TO: Eyes, skin, resp sys			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed	

<b>Vinyl bromide</b>		<b>Formula:</b> CH <sub>2</sub> =CHBr	<b>CAS#:</b> 593-60-2	<b>RTECS#:</b> KU8400000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 4.38 mg/m <sup>3</sup>		<b>DOT:</b> 1085 116P (inhibited)			
<b>Synonyms/Trade Names:</b> Bromoethene, Bromoethylene, Monobromoethylene					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 1009 OSHA 8	
<b>Physical Description:</b> Colorless gas or liquid (below 60°F) with a pleasant odor. [Note: Shipped as a liquefied compressed gas with 0.1% phenol added to prevent polymerization.]					
<b>Chemical &amp; Physical Properties:</b> MW: 107.0 BP: 60°F Sol: Insoluble Fl.P: NA (Gas) IP: 9.80 eV RGasD: 3.79 Sp.Gr: 1.49 (Liquid at 60°F) VP: 1.4 atm FRZ: -219°F UEL: 15% LEL: 9% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact (liquid) Eyes: Prevent eye contact (liquid) Wash skin: When contam (liquid) Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers (e.g., perchlorates, peroxides, chlorates, permanganates & nitrates.) [Note: May polymerize in sunlight.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing (liquid), Con SY: Irrit eyes, skin; dizz, conf, inco, narco, nau, vomit; liquid; frostbite; [carc] TO: Eyes, skin, CNS, liver [in animals: liver & lymph node tumors]			<b>First Aid (see Table 6):</b> Eye: Irr immed (liquid) Skin: Water flush immed (liquid) Breath: Resp support Swallow: Medical attention immed (liquid)		

<b>Vinyl chloride</b>		<b>Formula:</b> CH <sub>2</sub> =CHCl	<b>CAS#:</b> 75-01-4	<b>RTECS#:</b> KU9625000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 2.56 mg/m <sup>3</sup>		<b>DOT:</b> 1086 116P (inhibited)			
<b>Synonyms/Trade Names:</b> Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethene, Monochloroethylene, VC, Vinyl chloride monomer (VCM)					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL: [1910.1017] TWA 1 ppm C 5 ppm [15-minute]				<b>Measurement Methods</b> (see Table 1): NIOSH 1007 OSHA 4, 75	
<b>Physical Description:</b> Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. [Note: Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 62.5 BP: 7°F Sol(77°F): 0.1% Fl.P: NA (Gas) IP: 9.99 eV RGasD: 2.21 VP: 3.3 atm FRZ: -256°F UEL: 33.0% LEL: 3.6% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFS/ScbaE  <b>See Appendix E</b> (page 351)	
<b>Incompatibilities and Reactivities:</b> Copper, oxidizers, aluminum, peroxides, iron, steel [Note: Polymerizes in air, sunlight, or heat unless stabilized by inhibitors such as phenol. Attacks iron & steel in presence of moisture.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Lass; abdom pain, GI bleeding; enlarged liver; pallor or cyan of extremities; liquid: frostbite; [carc] TO: Liver, CNS, blood, resp sys, lymphatic sys [liver cancer]			<b>First Aid (see Table 6):</b> Eye: Frostbite Skin: Frostbite Breath: Resp support		

<b>Vinyl cyclohexene dioxide</b>	<b>Formula:</b> C <sub>8</sub> H <sub>12</sub> O <sub>2</sub>	<b>CAS#:</b> 106-87-6	<b>RTECS#:</b> RN8640000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b> 1 ppm = 5.73 mg/m <sup>3</sup>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> 1-Epoxyethyl-3,4-epoxy-cyclohexane; 4-Vinylcyclohexene diepoxide; 4-Vinyl-1-cyclohexene dioxide				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> Ca TWA 10 ppm (60 mg/m <sup>3</sup> ) [skin] See Appendix A <b>OSHA PEL†:</b> none			<b>Measurement Methods</b> (see Table 1): <b>OSHA</b> PV2083	
<b>Physical Description:</b> Colorless liquid.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 140.2 <b>BP:</b> 441°F <b>Sol:</b> High <b>Fl.P(oc):</b> 230°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.10 <b>VP:</b> 0.1 mmHg <b>FRZ:</b> -164°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Alcohols, amines, water [Note: Slowly hydrolyzes in water.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> In animals: irrit eyes, skin, resp sys; testicular atrophy; leupen, nec thymus; skin sens; [carc] <b>TO:</b> Eyes, skin, resp sys, blood, thymus, repro sys [in animals: skin tumors]			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Vinyl fluoride</b>	<b>Formula:</b> CH <sub>2</sub> =CHF	<b>CAS#:</b> 75-02-5	<b>RTECS#:</b> YZ3510000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 1.89 mg/m <sup>3</sup>		<b>DOT:</b> 1860 116P (inhibited)		
<b>Synonyms/Trade Names:</b> Fluoroethene, Fluoroethylene, Monofluoroethylene, Vinyl fluoride monomer				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 1 ppm C 5 ppm [use 1910.1017] <b>OSHA PEL:</b> none			<b>Measurement Methods</b> (see Table 1): None available	
<b>Physical Description:</b> Colorless gas with a faint, ethereal odor. [Note: Shipped as a liquefied compressed gas.]				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 46.1 <b>BP:</b> -98°F <b>Sol:</b> Insoluble <b>Fl.P:</b> NA (Gas) <b>IP:</b> 10.37 eV <b>RGasD:</b> 1.60 <b>VP:</b> 25.2 atm <b>FRZ:</b> -257°F <b>UEL:</b> 21.7% <b>LEL:</b> 2.6% Flammable Gas	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>10 ppm:</b> CcrOv/Sa <b>25 ppm:</b> Sa:Cf/PapRov <b>50 ppm:</b> CcrFOv/GmFOv/PapRTOV/ ScbaF/SaF <b>200 ppm:</b> SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported [Note: Inhibited with 0.2% terpenes to prevent polymerization.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con (liquid) <b>SY:</b> Head, dizz, conf, inco, narco, nau, vomit; liquid: frostbite <b>TO:</b> CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Vinylidene chloride</b>		<b>Formula:</b> CH <sub>2</sub> =CCl <sub>2</sub>	<b>CAS#:</b> 75-35-4	<b>RTECS#:</b> KV9275000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>		<b>DOT:</b> 1303 130P (inhibited)			
<b>Synonyms/Trade Names:</b> 1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride					
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: none				<b>Measurement Methods</b> (see Table 1): NIOSH 1015 OSHA 19	
<b>Physical Description:</b> Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 96.9 BP: 89°F Sol: 0.04% F.I.P: -2°F IP: 10.00 eV Sp.Gr: 1.21 VP: 500 mmHg FRZ: -189°F UEL: 15.5% LEL: 6.5% Class IA Flammable Liquid		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Aluminum, sunlight, air, copper, heat [ <b>Note:</b> Polymerization may occur if exposed to oxidizers, chlorosulfonic acid, nitric acid, or oleum. Inhibitors such as the monomethyl ether of hydroquinone are added to prevent polymerization.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, throat; dizz, head, nau, dysp; liver, kidney dist; pneu; [carc] TO: Eyes, skin, resp sys, CNS, liver, kidneys [in animals: liver & kidney tumors]				<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Vinylidene fluoride</b>		<b>Formula:</b> CH <sub>2</sub> =CF <sub>2</sub>	<b>CAS#:</b> 75-38-7	<b>RTECS#:</b> KW0560000	<b>IDLH:</b> N.D.
<b>Conversion:</b> 1 ppm = 2.62 mg/m <sup>3</sup>		<b>DOT:</b> 1959 116P			
<b>Synonyms/Trade Names:</b> Difluoro-1,1-ethylene; 1,1-Difluoroethene; 1,1-Difluoroethylene; Halocarbon 1132A; VDF; Vinylidene difluoride					
<b>Exposure Limits:</b> NIOSH REL: TWA 1 ppm C 5 ppm [use 1910.1017] OSHA PEL: none				<b>Measurement Methods</b> (see Table 1): NIOSH 3800	
<b>Physical Description:</b> Colorless gas with a faint, ethereal odor. [ <b>Note:</b> Shipped as a liquefied compressed gas.]					
<b>Chemical &amp; Physical Properties:</b> MW: 64.0 BP: -122°F Sol: Insoluble F.I.P: NA (Gas) IP: 10.29 eV RGasD: 2.21 VP: 35.2 atm FRZ: -227°F UEL: 21.3% LEL: 5.5% Flammable Gas		<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Frostbite <b>Eyes:</b> Frostbite <b>Wash skin:</b> N.R. <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R. <b>Provide:</b> Frostbite wash		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>10 ppm:</b> CcrOv/Sa <b>25 ppm:</b> Sa:Cf/Paprov <b>50 ppm:</b> CcrFOV/GmFOV/PapTOV/ ScbaF/SaF <b>200 ppm:</b> SaF:Pd,Pp ☒: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, aluminum chloride [ <b>Note:</b> Violent reaction with hydrogen chloride when heated under pressure.]					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con (liquid) SY: Dizz, head, nau; liquid: frostbite TO: CNS				<b>First Aid (see Table 6):</b> <b>Eye:</b> Frostbite <b>Skin:</b> Frostbite <b>Breath:</b> Resp support	

<b>Vinyl toluene</b>	<b>Formula:</b> CH <sub>2</sub> =CHC <sub>6</sub> H <sub>4</sub> CH <sub>3</sub>	<b>CAS#:</b> 25013-15-4 (inhibited)	<b>RTECS#:</b> WL5075000	<b>IDLH:</b> 400 ppm
<b>Conversion:</b> 1 ppm = 4.83 mg/m <sup>3</sup>		<b>DOT:</b> 2618 130P (inhibited)		
<b>Synonyms/Trade Names:</b> Ethenylmethylbenzene, Methylstyrene, Tolyethylene				
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (480 mg/m <sup>3</sup> ) OSHA PEL: TWA 100 ppm (480 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1501 OSHA 7	
<b>Physical Description:</b> Colorless liquid with a strong, disagreeable odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 118.2 BP: 339°F Sol: 0.009% F.I.P: 127°F IP: 8.20 eV Sp.Gr: 0.89 VP: 1 mmHg FRZ: -106°F UEL: 11.0% LEL: 0.8% Class II Combustible Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH/OSHA</b> <b>400 ppm:</b> CcrOv*/PaprOv*/ GmFOv/Sa*/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Oxidizers, peroxides, strong acids, iron or aluminum salts [Note: Usually inhibited with tert-butyl catechol to prevent polymerization.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; drow; in animals: narco TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap flush prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>VM &amp; P Naphtha</b>	<b>Formula:</b>	<b>CAS#:</b> 8032-32-4	<b>RTECS#:</b> O16180000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b> 1268 128 (petroleum distillates, n.o.s.)		
<b>Synonyms/Trade Names:</b> Ligroin, Painters naphtha, Petroleum ether, Petroleum spirit, Refined solvent naphtha, Varnish makers' & painters' naphtha				
<b>Exposure Limits:</b> NIOSH REL: TWA 350 mg/m <sup>3</sup> C 1800 mg/m <sup>3</sup> [15-minute] OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 1550 OSHA 48	
<b>Physical Description:</b> Clear to yellowish liquid with a pleasant, aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 87-114 (approx) BP: 203-320°F Sol: Insoluble F.I.P: 20-55°F IP: ? Sp.Gr(60°F): 0.73-0.76 VP: 2-20 mmHg FRZ: ? UEL: 6.0% LEL: 1.2% Class IB Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet (flamm) <b>Change:</b> N.R.		<b>Respirator Recommendations</b> (see Tables 3 and 4): <b>NIOSH</b> <b>3500 mg/m<sup>3</sup>:</b> CcrOv/Sa <b>8750 mg/m<sup>3</sup>:</b> Sa: Cf/PaprOv <b>17,500 mg/m<sup>3</sup>:</b> CcrFOv/GmFOv/PaprTOv/ ScbaF/SaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> None reported [Note: VM&P Naphtha is a refined petroleum solvent predominantly C <sub>7</sub> -C <sub>11</sub> which is typically 55% paraffins, 30% monocycloparaffins, 2% dicycloparaffins & 12% alkybenzenes.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes, upper resp sys; dermat; CNS depres; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash prompt <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

<b>Warfarin</b>	<b>Formula:</b> C <sub>19</sub> H <sub>16</sub> O <sub>4</sub>	<b>CAS#:</b> 81-81-2	<b>RTECS#:</b> GN4550000	<b>IDLH:</b> 100 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 3-( $\alpha$ -Acetyl)-benzyl-4-hydroxycoumarin; 4-Hydroxy-3-(3-oxo-1-phenyl butyl)-2H-1-benzopyran-2-one; WARF				
<b>Exposure Limits:</b> NIOSH REL: TWA 0.1 mg/m <sup>3</sup> OSHA PEL: TWA 0.1 mg/m <sup>3</sup>			<b>Measurement Methods</b> (see Table 1): NIOSH 5002	
<b>Physical Description:</b> Colorless, odorless, crystalline powder. [rodenticide]				
<b>Chemical &amp; Physical Properties:</b> MW: 308.3 BP: Decomposes Sol: 0.002% F.P.: ? IP: ? Sp.Gr.: ? VP(71°F): 0.09 mmHg MLT: 322°F UEL: ? LEL: ? Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: Daily	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 0.5 mg/m <sup>3</sup> : Qm 1 mg/m <sup>3</sup> : 95XQ/Sa 2.5 mg/m <sup>3</sup> : Sa:Cf/Pap/Hie 5 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 100 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Abs, Ing, Con SY: Hema, back pain; hematoma arms, legs; epis, bleeding lips, muc memb hemorrh; abdom pain, vomit, fecal blood; petechial rash; abnor hematologic indices TO: Blood, CVS			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Welding fumes</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> ZC2550000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Synonyms vary depending upon the specific component of the welding fumes.				
<b>Exposure Limits:</b> NIOSH REL: Ca See Appendix A OSHA PEL†: none			<b>Measurement Methods</b> (see Table 1): NIOSH 7300, 7301, 7303	
<b>Physical Description:</b> Fumes generated by the process of joining or cutting pieces of metal by heat, pressure, or both.				
<b>Chemical &amp; Physical Properties:</b> Properties vary depending upon the specific component of the welding fumes.	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV100/ScbaE		
<b>Incompatibilities and Reactivities:</b> Varies				
<b>Exposure Routes, Symptoms, Target Organs</b> (see Table 5): ER: Inh, Con SY: Symptoms vary depending upon the specific component of the welding fumes; metal fume fever: flu-like symptoms, dysp, cough, musc pain, fever, chills; interstitial pneu; [carc] TO: Eyes, skin, resp sys, CNS [lung cancer]			<b>First Aid</b> (see Table 6): Eye: Irr immed Skin: Soap wash Breath: Resp support	

<b>Wood dust</b>	<b>Formula:</b>	<b>CAS#:</b>	<b>RTECS#:</b> ZC9850000	<b>IDLH:</b> Ca [N.D.]
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Hard wood dust, Soft wood dust, Western red cedar dust				
<b>Exposure Limits:</b> NIOSH REL: Ca TWA 1 mg/m <sup>3</sup> See Appendix A OSHA PEL†: TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods</b> (see Table 1): NIOSH 0500	
<b>Physical Description:</b> Dust from various types of wood.				
<b>Chemical &amp; Physical Properties:</b> MW: varies BP: NA Sol: ? Fl.P: NA IP: NA Sp.Gr: ? VP: 0 mmHg (approx) MLT: NA UEL: NA LEL: NA Combustible Solid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes; epis; dermat; resp hypersensitivity; granulomatous pneu; asthma, cough, wheez, sinusitis; prolonged colds; [carc] TO: Eyes, skin, resp sys [nasal cancer]		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash Breath: Fresh air		

<b>m-Xylene</b>	<b>Formula:</b> C <sub>8</sub> H <sub>10</sub> (CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 108-38-3	<b>RTECS#:</b> ZE2275000	<b>IDLH:</b> 900 ppm
<b>Conversion:</b> 1 ppm = 4.34 mg/m <sup>3</sup>	<b>DOT:</b> 1307 130			
<b>Synonyms/Trade Names:</b> 1,3-Dimethylbenzene; meta-Xylene; m-Xylol				
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (435 mg/m <sup>3</sup> ) ST 150 ppm (655 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (435 mg/m <sup>3</sup> )			<b>Measurement Methods</b> (see Table 1): NIOSH 1501, 3800 OSHA 1002	
<b>Physical Description:</b> Colorless liquid with an aromatic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 106.2 BP: 282°F Sol: Slight Fl.P: 82°F IP: 8.56 eV Sp.Gr: 0.86 VP: 9 mmHg FRZ: -54°F UEL: 7.0% LEL: 1.1% Class IC Flammable Liquid	<b>Personal Protection/Sanitation</b> (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.	<b>Respirator Recommendations</b> (see Tables 3 and 4): NIOSH/OSHA 900 ppm: CcrOv*/PapPrOv*/ Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE		
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, excitement, drow, inco, staggering gait; corn vacuolization; anor, nau, vomit, abdom pain; dermat TO: Eyes, skin, resp sys, CNS, GI tract, blood, liver, kidneys		<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

<b>o-Xylene</b>		<b>Formula:</b> C <sub>8</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 95-47-6	<b>RTECS#:</b> ZE2450000	<b>IDLH:</b> 900 ppm
<b>Conversion:</b> 1 ppm = 4.34 mg/m <sup>3</sup>		<b>DOT:</b> 1307 130			
<b>Synonyms/Trade Names:</b> 1,2-Dimethylbenzene; ortho-Xylene; o-Xylol					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (435 mg/m <sup>3</sup> ) ST 150 ppm (655 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (435 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1501, 3800 OSHA 1002	
<b>Physical Description:</b> Colorless liquid with an aromatic odor.					
<b>Chemical &amp; Physical Properties:</b> MW: 106.2 BP: 292°F Sol: 0.02% Fl.P: 90°F IP: 8.56 eV Sp.Gr: 0.88 VP: 7 mmHg FRZ: -13°F UEL: 6.7% LEL: 0.9% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 900 ppm: CcrOv*/PapRov*/Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, excitement, drow, inco, staggering gait; corn vacuolization; anor, nau, vomit, abdom pain; derm TO: Eyes, skin, resp sys, CNS, GI tract, blood, liver, kidneys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>p-Xylene</b>		<b>Formula:</b> C <sub>8</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	<b>CAS#:</b> 106-42-3	<b>RTECS#:</b> ZE2625000	<b>IDLH:</b> 900 ppm
<b>Conversion:</b> 1 ppm = 4.41 mg/m <sup>3</sup>		<b>DOT:</b> 1307 130			
<b>Synonyms/Trade Names:</b> 1,4-Dimethylbenzene; para-Xylene; p-Xylol					
<b>Exposure Limits:</b> NIOSH REL: TWA 100 ppm (435 mg/m <sup>3</sup> ) ST 150 ppm (655 mg/m <sup>3</sup> ) OSHA PEL†: TWA 100 ppm (435 mg/m <sup>3</sup> )				<b>Measurement Methods (see Table 1):</b> NIOSH 1501, 3800 OSHA 1002	
<b>Physical Description:</b> Colorless liquid with an aromatic odor. [Note: A solid below 56°F.]					
<b>Chemical &amp; Physical Properties:</b> MW: 106.2 BP: 281°F Sol: 0.02% Fl.P: 81°F IP: 8.44 eV Sp.Gr: 0.86 VP: 9 mmHg FRZ: 56°F UEL: 7.0% LEL: 1.1% Class IC Flammable Liquid		<b>Personal Protection/Sanitation (see Table 2):</b> Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 900 ppm: CcrOv*/PapRov*/Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOV/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, strong acids					
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, excitement, drow, inco, staggering gait; corn vacuolization; anor, nau, vomit, abdom pain; derm TO: Eyes, skin, resp sys, CNS, GI tract, blood, liver, kidneys				<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>m-Xylene <i>o,o'</i>-diamine</b>	<b>Formula:</b> C <sub>8</sub> H <sub>4</sub> (CH <sub>2</sub> NH <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 1477-55-0	<b>RTECS#:</b> PF8970000	<b>IDLH:</b> N.D.
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> 1,3-bis(Aminomethyl)benzene; 1,3-Benzenedimethanamine; MXDA; m-Phenylenebis(methylamine); m-Xylylenediamine				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> C 0.1 mg/m <sup>3</sup> [skin] <b>OSHA PEL†:</b> none			<b>Measurement Methods (see Table 1):</b> <b>OSHA 105</b>	
<b>Physical Description:</b> Colorless liquid.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 136.2 <b>BP:</b> 477°F <b>Sol:</b> Miscible <b>F.I.P.:</b> 243°F <b>IP:</b> ? <b>Sp.Gr:</b> 1.032 <b>VP(77°F):</b> 0.03 mmHg <b>FRZ:</b> 58°F <b>UEL:</b> ? <b>LEL:</b> ? Class IIIB Combustible Liquid	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
<b>Incompatibilities and Reactivities:</b> None reported				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> In animals: irrit eyes, skin; liver, kidney, lung damage <b>TO:</b> Eyes, skin, resp sys, liver, kidneys		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Water flush immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Xylidine</b>	<b>Formula:</b> (CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> NH <sub>2</sub>	<b>CAS#:</b> 1300-73-8	<b>RTECS#:</b> ZE8575000	<b>IDLH:</b> 50 ppm
<b>Conversion:</b> 1 ppm = 4.96 mg/m <sup>3</sup>	<b>DOT:</b> 1711 153			
<b>Synonyms/Trade Names:</b> Aminodimethylbenzene, Aminoxylene, Dimethylaminobenzene, Dimethylaniline, Xylidine isomers (e.g., 2,4-Dimethylaniline) [Note: Dimethylaniline is also used as a synonym for N,N-Dimethylaniline.]				
<b>Exposure Limits:</b> <b>NIOSH REL:</b> TWA 2 ppm (10 mg/m <sup>3</sup> ) [skin] <b>OSHA PEL†:</b> TWA 5 ppm (25 mg/m <sup>3</sup> ) [skin]			<b>Measurement Methods (see Table 1):</b> <b>NIOSH 2002</b>	
<b>Physical Description:</b> Pale-yellow to brown liquid with a weak, aromatic, amine-like odor.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 121.2 <b>BP:</b> 415-439°F <b>Sol:</b> Slight <b>F.I.P.:</b> 206°F (2,3-) <b>IP:</b> 7.65 eV (2,4-) 7.30 eV (2,6-) <b>Sp.Gr:</b> 0.98 <b>VP:</b> <1 mmHg <b>FRZ:</b> -33°F <b>UEL:</b> ? <b>LEL:</b> 1.0% (o-isomer) Class IIIB Combustible Liquid (2,3-)	<b>Personal Protection/Sanitation (see Table 2):</b> <b>Skin:</b> Prevent skin contact <b>Eyes:</b> Prevent eye contact <b>Wash skin:</b> When contam <b>Remove:</b> When wet or contam <b>Change:</b> N.R. <b>Provide:</b> Eyewash Quick drench		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH</b> <b>20 ppm:</b> CrOv/Sa <b>50 ppm:</b> Sa:Cf/CrFOv/GmFOv/ PapOv/ScbaF/SaF <b>§:</b> ScbaF:Pd,Pp/SaF:Pd,Pp:AScba <b>Escape:</b> GmFOv/ScbaE	
<b>Incompatibilities and Reactivities:</b> Strong oxidizers, hypochlorite salts				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Abs, Ing, Con <b>SY:</b> Anoxia, cyan, methemo; lung, liver, kidney damage <b>TO:</b> Resp sys, blood, liver, kidneys, CVS		<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash immed <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed		

<b>Yttrium</b>	<b>Formula:</b> Y	<b>CAS#:</b> 7440-65-5	<b>RTECS#:</b> ZG2980000	<b>IDLH:</b> 500 mg/m <sup>3</sup> (as Y)
<b>Conversion:</b>	<b>DOT:</b>			
<b>Synonyms/Trade Names:</b> Yttrium metal				
<b>Exposure Limits:</b> NIOSH REL*: TWA 1 mg/m <sup>3</sup> OSHA PEL*: TWA 1 mg/m <sup>3</sup> [*Note: The REL and PEL also apply to other yttrium compounds (as Y).]			<b>Measurement Methods (see Table 1):</b> NIOSH 7300, 7301, 7303, 9102 OSHA ID121	
<b>Physical Description:</b> Dark-gray to black, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 88.9 BP: 5301°F Sol: Soluble in hot H <sub>2</sub> O F.I.P: NA IP: NA Sp.Gr: 4.47 VP: 0 mmHg (approx) MLT: 2732°F UEL: NA LEL: NA Noncombustible Solid in bulk form.	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 5 mg/m <sup>3</sup> : Qm 10 mg/m <sup>3</sup> : 95XQ/Sa 25 mg/m <sup>3</sup> : Sa:Cf/PaprHie 50 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 500 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Oxidizers				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Ing, Con SY: Irrit eyes; in animals: pulm irrit; eye inj; possible liver damage TO: Eyes, resp sys, liver			<b>First Aid (see Table 6):</b> Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

<b>Zinc chloride fume</b>	<b>Formula:</b> ZnCl <sub>2</sub>	<b>CAS#:</b> 7646-85-7	<b>RTECS#:</b> ZH1400000	<b>IDLH:</b> 50 mg/m <sup>3</sup>
<b>Conversion:</b>	<b>DOT:</b> 2331 154			
<b>Synonyms/Trade Names:</b> Zinc dichloride fume				
<b>Exposure Limits:</b> NIOSH REL: TWA 1 mg/m <sup>3</sup> ST 2 mg/m <sup>3</sup> OSHA PEL†: TWA 1 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> OSHA ID121	
<b>Physical Description:</b> White particulate dispersed in air.				
<b>Chemical &amp; Physical Properties:</b> MW: 136.3 BP: 1350°F Sol(70°F): 435% F.I.P: NA IP: NA Sp.Gr(77°F): 2.91 VP: 0 mmHg (approx) MLT: 554°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 10 mg/m <sup>3</sup> : 95XQ*/Sa* 25 mg/m <sup>3</sup> : Sa:C*/PaprHie* 50 mg/m <sup>3</sup> : 100F/PaprTHie*/ScbaF/SaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
<b>Incompatibilities and Reactivities:</b> Potassium				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh, Con SY: Irrit eyes, skin, nose, throat; conj; cough, copious sputum; dysp, chest pain, pulm edema, pneu; pulm fib, cor pulmonale; fever; cyan; tachypnea; skin burns TO: Eyes, skin, resp sys, CVS			<b>First Aid (see Table 6):</b> Breath: Resp support	

<b>Zinc oxide</b>	<b>Formula:</b> ZnO	<b>CAS#:</b> 1314-13-2	<b>RTECS#:</b> ZH4810000	<b>IDLH:</b> 500 mg/m <sup>3</sup>
<b>Conversion:</b>		<b>DOT:</b> 1516 143		
<b>Synonyms/Trade Names:</b> Zinc peroxide				
<b>Exposure Limits:</b> NIOSH REL: Dust: TWA 5 mg/m <sup>3</sup> C 15 mg/m <sup>3</sup> Fume: TWA 5 mg/m <sup>3</sup> ST 10 mg/m <sup>3</sup> OSHA PEL†: TWA 5 mg/m <sup>3</sup> (fume) TWA 15 mg/m <sup>3</sup> (total dust) TWA 5 mg/m <sup>3</sup> (resp dust)			<b>Measurement Methods (see Table 1):</b> NIOSH 7303, 7502 OSHA ID121, ID143	
<b>Physical Description:</b> White, odorless solid.				
<b>Chemical &amp; Physical Properties:</b> MW: 81.4 BP: ? Sol(64°F): 0.0004% F.I.P: NA IP: NA Sp.Gr: 5.61 VP: 0 mmHg (approx) MLT: 3587°F UEL: NA LEL: NA Noncombustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> NIOSH/OSHA 50 mg/m <sup>3</sup> : 95XQ/Sa 125 mg/m <sup>3</sup> : Sa:Cf/PaprHie 250 mg/m <sup>3</sup> : 100F/SaT:Cf/PaprTHie/ ScbaF/SaF 500 mg/m <sup>3</sup> : Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
	<b>Incompatibilities and Reactivities:</b> Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inh SY: Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude; metallic taste; headache; blurred vision; low back pain; vomiting; malaise; chest tightness; dyspnea, rales, decreased pulmonary function TO: Respiratory system			<b>First Aid (see Table 6):</b> Breath: Respiratory support	

<b>Zinc stearate</b>	<b>Formula:</b> Zn(C <sub>18</sub> H <sub>35</sub> O <sub>2</sub> ) <sub>2</sub>	<b>CAS#:</b> 557-05-1	<b>RTECS#:</b> ZH5200000	<b>IDLH:</b> N.D.
<b>Conversion:</b>		<b>DOT:</b>		
<b>Synonyms/Trade Names:</b> Dibasic zinc stearate, Zinc salt of stearic acid, Zinc distearate				
<b>Exposure Limits:</b> NIOSH REL: TWA 10 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)			<b>Measurement Methods (see Table 1):</b> NIOSH 0500, 0600	
<b>Physical Description:</b> Soft, white powder with a slight, characteristic odor.				
<b>Chemical &amp; Physical Properties:</b> MW: 632.4 BP: ? Sol: Insoluble F.I.P(oc): 530°F IP: NA Sp.Gr: 1.10 VP: 0 mmHg (approx) MLT: 266°F UEL: ? LEL: ? MEC: 20 g/m <sup>3</sup> Combustible Solid	<b>Personal Protection/Sanitation (see Table 2):</b> Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		<b>Respirator Recommendations (see Tables 3 and 4):</b> Not available.	
	<b>Incompatibilities and Reactivities:</b> Oxidizers, dilute acids [Note: Hydrophobic (i.e., repels water).]			
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> ER: Inhalation, Ingestion, Contact SY: Irritation of eyes, skin, upper respiratory system; cough TO: Eyes, skin, respiratory system			<b>First Aid (see Table 6):</b> Eye: Irritation immediate Skin: Soap wash Breath: Fresh air Swallow: Medical attention immediate	

<b>Zirconium compounds (as Zr)</b>	<b>Formula:</b> Zr (metal)	<b>CAS#:</b> 7440-67-7 (metal)	<b>RTECS#:</b> ZH7070000 (metal)	<b>IDLH:</b> 50 mg/m <sup>3</sup> (as Zr)
<b>Conversion:</b>	<b>DOT:</b> 1358 170 (powder, wet); 1932 135 (scrap); 2008 135 (powder, dry)			
<b>Synonyms/Trade Names:</b> Zirconium metal: Zirconium Synonyms of other zirconium compounds vary depending upon the specific compound.				
<b>Exposure Limits:</b> <b>NIOSH REL*:</b> TWA 5 mg/m <sup>3</sup> ST 10 mg/m <sup>3</sup> [*Note: The REL applies to all zirconium compounds (as Zr) except Zirconium tetrachloride.] <b>OSHA PEL†:</b> TWA 5 mg/m <sup>3</sup>			<b>Measurement Methods (see Table 1):</b> <b>NIOSH</b> 7300, 7301, 9102 <b>OSHA</b> ID121	
<b>Physical Description:</b> Metal: Soft, malleable, ductile, solid or gray to gold, amorphous powder.				
<b>Chemical &amp; Physical Properties:</b> <b>MW:</b> 91.2 <b>BP:</b> 6471°F <b>Sol:</b> Insoluble <b>Fl.P:</b> NA <b>IP:</b> NA <b>Sp.Gr:</b> 6.51 (Metal) <b>VP:</b> 0 mmHg (approx) <b>MLT:</b> 3375°F <b>UEL:</b> NA <b>LEL:</b> NA Metal: Combustible, but solid form is difficult to ignite; however, powder form may ignite SPONTANEOUSLY and can continue burning under water.	<b>Personal Protection/Sanitation (see Table 2):</b> Recommendations regarding personal protective clothing vary depending upon the specific compound.		<b>Respirator Recommendations (see Tables 3 and 4):</b> <b>NIOSH/OSHA</b> <b>25 mg/m<sup>3</sup>:</b> Qm <b>50 mg/m<sup>3</sup>:</b> 95XQ/PapriHie/100F/Sa/ScbaF <b>§:</b> ScbaF: Pd, Pp/SaF: Pd, Pp: AScba <b>Escape:</b> 100F/ScbaE	
<b>Incompatibilities and Reactivities:</b> Potassium nitrate, oxidizers [Note: Fine powder may be stored completely immersed in water.]				
<b>Exposure Routes, Symptoms, Target Organs (see Table 5):</b> <b>ER:</b> Inh, Con <b>SY:</b> Skin, lung granulomas; in animals: irrit skin, muc memb; X-ray evidence of retention in lungs <b>TO:</b> Skin, resp sys			<b>First Aid (see Table 6):</b> <b>Eye:</b> Irr immed <b>Skin:</b> Soap wash <b>Breath:</b> Resp support <b>Swallow:</b> Medical attention immed	

**APPENDIX C**

**List of Approved Amendments/changes**  
**CHASP Acknowledgement/Agreement Form**  
**Visitors Log**  
**Tailgate Safety Meeting Form**  
**Air Quality Monitoring Record**  
**Equipment Calibration Log**  
**Checklist for Subsurface Investigation**  
**Monthly Heavy Equipment Safety Inspection Checklist**







## CONSTRUCTION HEALTH AND SAFETY PLAN (CHASP) Tailgate Safety Meeting Form

Site Name & Number: \_\_\_\_\_

ATC Project Number: \_\_\_\_\_

Work Being Performed: \_\_\_\_\_

Date & Time of Meeting: \_\_\_\_\_

Name of Presenter: \_\_\_\_\_

**NOTE:** On the initial day of the project, the Project Manager or designee should conduct a visual inspection of the project site (using the Site Safety Checklist) prior to the Tailgate Safety Meeting. This inspection should include a review of project site equipment, hazards, and specific job tasks, activities or operations to be performed for that day. These specific items must be covered during the Tailgate Safety Meeting. For subsequent days, any changes to the site or operations must be covered in the Tailgate Safety Meeting. In addition, "Task-Specific" Job Safety Analysis (JSA) for the tasks/activities at the project site must be integrated into the CHASP and Tailgate discussions.

**Itemize the Specific Topics Discussed (if more space is needed use the back of this page):**

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Are all employees okay? | <input type="checkbox"/> Are all employees physically able to perform their job duties? | <input type="checkbox"/> "Shared Learning" items?                 |
| <input type="checkbox"/> Has PPE been checked?   | <input type="checkbox"/> Emergency evacuation area identified?                          | <input type="checkbox"/> Asked for Sub interactions or questions? |

**Client Requirements** - By checking the box to the left, the Presenter of the Tailgate Meeting acknowledges that all Client-specific requirements have been completed for both ATC and Subcontractor employees.

**Participants (if needed, list additional participants on back of this page):**

Print Name	Signature	Company	Date

A Tailgate Safety Meeting must be conducted and documented at the beginning of each workday when two or more ATC employees and/or Subcontractor representatives are present on site. Employees, client representatives and subcontractors who arrive at the site after the Tailgate Safety Meeting has been conducted must be briefed on the topics and acknowledge by signing this form. The JSA must be completed at the beginning of each day when one or more ATC employees and/or subcontractor representatives are present on a site.







MUST be filled out PRIOR to the Start of Field Activities

NO subsurface work in road Right of Ways or Off-Site (property boundary) without Written Authorization

Site Address: \_\_\_\_\_ If Present --

**Site Safety Documents (on-site during activities)**

**"Yes or No" Fill Out, as applicable**

Utility Staking Request Form (properly completed for current scope of work)?	Yes	No	Ticket # and Expir. Date: #	/	/
Site Health and Safety Plan?	Yes	No	Hospital Location Map Available	Yes	No

**Utility Identification "color"  
Above Ground (AG) / Buried (B)**

**Identify on a Site Map the Location of ALL  
Lines & Meters (or actual utility) and  
Indicate Nearest Building Quadrant (NE, SE,  
SW, or NW)**

Natural Gas (Yellow) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Electrical (Red) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Telephone/Fiber Optic (Orange) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Cable TV (Orange) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Water (Blue) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Sewer (Green) / Staked?	AG / B	Yes	No	NW	NE	SE	SW

**Site Feature Located in Closest Property  
Quadrant  
(NE, SE, SW, or NW). Also Identify on Site  
Map.**

**Significant Site Features**

UST system (UST cavity, dispenser islands, piping runs, vent pipes etc.)?	Yes	No
Above Ground Storage Tanks – ASTs (dispenser islands, piping runs)?	Yes	No
Electrical Transformers?	Yes	No
Area Lighting (Pole mounted lighting, etc.)?	Yes	No
Signage with electrical power (Business/Company signs, etc.)?	Yes	No
Underground lawn/landscaping sprinkler system?	Yes	No
Storm drain catch basins / man-ways and potential connecting conduits/lines?	Yes	No

**"Other" Concerns Located in Closest  
Property  
Quadrant (NE, SE, SW, or NW). Identify on  
Site Map.**

**Other**

Pavement distress (Cracked pavement, "buckled" asphalt, etc.)?	Yes	No
--	-----	----

\*Buried utilities can be found at any depth, but are most often found within the first 5 feet below the ground surface. Proceed slowly and with extra caution when working within 5 feet of the ground surface.

NOTES:

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

## Monthly Mobile/Heavy Equipment Safety Inspection Checklist

This form is to be completed by the qualified operator of the equipment

Date:		Project No.:		Site/Location:		
Equipment Type:		Model No.:		Odometer:		
Operator/Inspector Name:				Machine Hours:		
<p><b>Warning:</b> Do not operate a malfunctioning machine until corrective measures have been taken and all discrepancies have been cleared by a qualified operator/mechanic. In addition to elements on this checklist, the owner's manual for the specific piece of equipment being operated may contain other daily inspection checks and/or preventative maintenance procedures.</p>						
<b>General Safety</b>	<input type="checkbox"/>	Operator Qualification	<input type="checkbox"/>	PPE Supplies	<input type="checkbox"/>	Fire Extinguisher (ready-to-use)
	<input type="checkbox"/>	Owner's Manual (present)	<input type="checkbox"/>	Driver Check (decal in place)	<input type="checkbox"/>	First-Aid Kit (present & stocked)
	<input type="checkbox"/>	Manufacturer Specs Followed	<input type="checkbox"/>	Access Ladder (secure and ok)	<input type="checkbox"/>	Housekeeping (clean)
	<input type="checkbox"/>	Emergency Kit (signs, flares)	<input type="checkbox"/>	Flashlight	<input type="checkbox"/>	Markers (cones, barricades, etc.)
<b>Vehicle, Engine, and Hydraulic Systems</b> (note any added fluid)	<input type="checkbox"/>	Engine Oil (fluid level, condition)	<input type="checkbox"/>	Fuel Level	<input type="checkbox"/>	Other Fluid
	<input type="checkbox"/>	Transmission (fluid level, fluid condition, unit operation)	<input type="checkbox"/>	Brake Fluid	<input type="checkbox"/>	Steering (power steering fluid level, no play in steering)
	<input type="checkbox"/>	Radiator (coolant level, hose condition)	<input type="checkbox"/>	Fan Belts (tension/condition)	<input type="checkbox"/>	Brakes (vehicle, parking)
	<input type="checkbox"/>	Hydraulic System (fluid level, fluid condition, hose condition, cylinders, leakage)	<input type="checkbox"/>	Chassis (proper lubrication)	<input type="checkbox"/>	Tires (condition, inflation)
	<input type="checkbox"/>	Outriggers (operational, if equipped)	<input type="checkbox"/>		<input type="checkbox"/>	
<b>Tracked Vehicles</b>	<input type="checkbox"/>	Track Tension (proper tension)	<input type="checkbox"/>	Plates and/or Shoes	<input type="checkbox"/>	Grouser Plates
	<input type="checkbox"/>	Rollers	<input type="checkbox"/>	Drive Sprockets		
<b>Lights and alarms</b> (clean and functional)	<input type="checkbox"/>	Headlights (hi, low, run beams)	<input type="checkbox"/>	Parking Lights	<input type="checkbox"/>	Revolving Flashing Lights (if required)
	<input type="checkbox"/>	Reverse Lights (backup)	<input type="checkbox"/>	Equipment Work Lights	<input type="checkbox"/>	Horn
	<input type="checkbox"/>	Brake/Tail Lights	<input type="checkbox"/>	Turn Signals/Hazard Flashers	<input type="checkbox"/>	Reverse Alarms (backup)
<b>Vehicle cab</b> (clean and functional)	<input type="checkbox"/>	Seatbelts (if required)	<input type="checkbox"/>	Windshield Wipers	<input type="checkbox"/>	Body Damage
	<input type="checkbox"/>	Housekeeping	<input type="checkbox"/>	2 Way Communication	<input type="checkbox"/>	Speed/Hour Meter
	<input type="checkbox"/>	Fuel Gauge	<input type="checkbox"/>	Horn (operational)	<input type="checkbox"/>	Windshield (glass ok, clean)
	<input type="checkbox"/>	Controls Operational	<input type="checkbox"/>	Mirrors (rear view, side)		
Maintenance/ Equipment Request			Corrected By:		Date:	
Inspectors Signature:					Date	

## **APPENDIX D**

### **Excavating & Trenching**

All ATC employees and subcontractors shall be trained and be familiar with the OSHA Excavation Standard and the ATC Employee Health and Safety Policy Manual, Policy No. 16 (Excavation and Trenching) and Policy No. 33 (Subsurface Investigation).

#### **1.0 UNDERGROUND UTILITIES**

Prior to any work beginning, the estimated location of utility installations (such as sewer, telephone, fuel, electric, water lines, or any other underground installation) that reasonably may be expected to be encountered during excavation work must be determined prior to opening an excavation. Utility companies or owners shall be contacted and advised of the proposed work and asked to establish the location of the utility underground installations. When utility companies or owners cannot respond to a request to locate underground utilities within 24-48 hours (unless a longer period is required by State or local law), or cannot establish the exact location of these installations, the work may proceed, provided that the work is conducted with caution, and provided detection equipment or other acceptable means to located utilities are used.

When excavation operations approach the estimated location of underground installations (approximately 18 inches from the installation), the exact location of the installations shall be determined by a safe and acceptable means. While the excavation is open, underground installations shall be protected, supported, or removed to safeguard employees.

#### **2.0 ENTERING EXCAVATIONS OR TRENCHES**

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a “*Competent Person*” for evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the Competent Person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. All inspections made by the Competent Person should be recorded in the field log book.

No person(s) shall perform work in a trench or excavation that contains accumulated water.

##### **2.1.1 Access/Egress**

A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel distance in any direction.

##### **2.1.2 Exposure to Falling Loads**

No employee or subcontractor is permitted underneath loads handled by lifting or digging equipment. All personnel shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by spilling or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the equipment is provided with a cab shield and/or canopy adequate to protect the operator from falling materials.

##### **2.1.3 Warning Systems**

When mobile equipment is operated adjacent to an excavation and the operators/drivers do not have a clear and direct view of the edge of the excavation, a warning system such as barricades, hand or mechanical signals, or stop logs are required.

## **APPENDIX D**

### **Excavating & Trenching**

#### **2.1.4 Protection from Loose Rock or Soil**

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard to personnel in the excavation. All temporary spoil piles shall be kept at least 2 feet away from the edge of the excavation. Spoil piles should be placed to channel rainwater or other run-off water away from the excavation.

#### **2.1.5 Hazardous Atmospheres**

All excavations deeper than 4 feet deep and which have the potential to have a hazardous atmosphere or oxygen deficient atmospheres (Less than 19.5% oxygen) must be tested to ensure safe working conditions, prior to entry. Air monitoring shall be conducted in accordance with Section 4.0 of the CHASP.

#### **2.1.6 Protective Systems**

Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when excavations are made entirely in stable rock or the excavation is less than 5 feet in depth and examination by the Competent Person provides no indication of a potential cave-in. Protective systems consist of sloping or benching, use of trench boxes or other shielding mechanisms, or the use of a shoring system in accordance with the regulations.

## **APPENDIX E**

### **Lockout/Tag out Requirements & Procedures**

#### **1.0 DEFINITIONS**

1. Lockout – Involves using a device such as a padlock, blank pipe flange, chain key block, etc. to isolate energy from employee exposure.
2. Tag out – Involves applying a tag to the energy isolating device with written information concerning the date and name of person who applied the lock and tag.

#### **2.0 LOCKOUT/TAGOUT POLICY**

This procedure establishes the minimum requirements for lockout/tag out of electrical energy sources, mechanical, hydraulic, pneumatic, thermal or chemical process energy. It is to be used to ensure that conductors and circuit parts are disconnected from sources of electrical energy, locked (tagged), and tested before work begins where employees or subcontractor could be exposed to dangerous conditions. Sources of stored energy, such as capacitors or springs, shall be relieved of their energy, and a mechanism shall be engaged to prevent the re-accumulation of energy.

Lockout/tag out procedures shall be used prior to performing tie-in operations, maintenance, repair or adjustment of any device where exposure to hazardous energy sources may occur.

#### **3.0 RESPONSIBILITY**

All effected employees and subcontractors shall be instructed in the safety significance of the lockout/tag out procedure. All new or transferred employees and all other persons whose work operations are or might be in the area shall be instructed in the purpose and use of this procedure. The ATC Project Manager shall ensure that appropriate personnel receive instructions on their roles and responsibilities. All persons installing a lockout/tag out device shall sign their names and the date on the tag and on the Lockout/Tag out Isolation Record (see Appendix E.1).

#### **4.0 PREPARATION FOR LOCKOUT/TAGOUT**

1. Review current diagrammatic drawings (or other equally effective means), tags, labels, and signs to identify and locate all disconnecting means to determine that the source of energy is interrupted by a physical break and not deenergized by a circuit interlock. Make a list of disconnecting means to be locked/tagged.
2. Review other work activities to identify where and how other personnel might be exposed to sources of energy. Establish energy control methods for control of other hazardous energy sources in the area.
3. Provide an adequately rated voltage detector to test each electrical phase conductor or circuit part to verify that they are deenergized. Test the voltage detector to make sure that it is working properly.

#### **5.0 LOCKOUT PROCEDURE**

1. Complete the Lockout/Tag out Isolation Record (see Appendix E.1).
2. All affected employees in the area shall be notified that a lockout is being performed.
3. The equipment being locked out shall be shut down using normal shutdown procedures. (I.e. operator's control station, stop button, etc.).
4. Any residual energy shall be identified and dissipated at this time.
5. All equipment energy sources shall be neutralized. (i.e. electrical disconnects shall be opened, valves closed, blanks inserted in piping, springs returned to neutral position, other energy sources as required)

## **APPENDIX E**

### **Lockout/Tag out Requirements & Procedures**

6. The qualified employee performing the lockout shall place his/her personal lock and tag on EACH energy isolation point isolated in Step 4. If more than two (2) isolation points are required to lockout the device, a group lockbox may be used. A tag indicating all persons who applied a lock, date, time, equipment type, and number and duration of lockout shall also be applied at this time. A subcontractor representative and an ATC employee shall also apply a lock at this time.
7. Test the lockout by clearing the area and attempting to operate the machine or attempting to operate disconnecting means to determine that the operation is prohibited. A voltage-detecting instrument should be used for electrical components. Inspect the instrument prior to use for physical damage and operation.

#### **6.0 REMOVAL OF LOCKOUT/TAGOUT**

1. Upon completion of the lockout an authorized employee must check the area for completeness of work. If the employee who initiated the lockout is available, he/she should conduct this inspection.
2. Remove all tools and nonessential items from the area.
3. Replace all guards.
4. Ensure all employees are clear of the equipment/process.
5. Notify all affected employees in the area that the lockout device(s) are being removed.
6. Remove lockout device(s).
7. Restart the machine to insure proper operation.

#### **7.0 GROUP LOCKOUT**

1. When multiple isolation points, three (3) or more, must be controlled during a lockout, or when multiple persons (craft) are involved, a group lockout shall be used.
2. Follow the steps for a normal lockout as documented in steps 1-6 above.
3. Each key for the locks used shall be placed in a group lockout box. The group lockbox shall be kept in view of the work being performed when practical.
4. A Job Control Lock shall be installed on the group lockbox by an ATC Employee. This lock shall remain in place until the lockout has been completed.
5. Each employee shall remove their own lock when their portion of the work is completed or at the end of each shift.
6. Upon completion of the work, the ATC employee shall inspect the work area for completeness.
7. When all of the conditions of the lockout termination procedures have been satisfied, the Job Control Lock shall be removed from the group lockbox.

#### **8.0 EMERGENCY REMOVAL LOCKOUT/TAGOUT DEVICE**

1. If an employee leaves the facility without removing his/her lock and tag, an effort shall be made to notify the employee that the supervisor in charge will authorize the removal of their lock. It must be deemed necessary that removal of the lock is required by at least two supervisory personnel, but only after confirming beyond any doubt it is safe to do so.
2. Verify the employee has left the Site.
3. Check with co-workers.
4. Check the employee's time card.
5. Attempt to reach him/her at home.

**APPENDIX E**  
**Lockout/Tag out Requirements & Procedures**

6. Verify the employee is not in the equipment.
7. Visually confirm the completeness of work.
8. Contact the Regional Safety Coordinator and the Project Manager.
9. An authorized employee, under the direct supervision of an ATC Supervisor shall remove the lock.
10. Upon return to the Site by the employee involved, he/she shall be informed of the removal.
11. A review of the incident may be conducted by the ATC RSC Coordinator to determine any disciplinary actions necessary.

