



University Department of Safety & Health

Hazard Communication/Right-to-Know Plan for
Facilities Management Staff

January 2009

1. INTRODUCTION

In the past, there was no guarantee that workers would be told about the hazards they might face on the job. Container labels and material safety data sheets, even when they were provided, did not always give enough information on potential hazards, or what to do in an emergency or who to turn to for assistance.

Today, our society is acutely aware of its environment, especially its working environment, and is reacting as a whole to regulate hazardous substances therein. This social reaction has resulted in the federal government mandating the Occupational Safety & Health Administration (OSHA) to write a uniform hazard communication standard stating that employers have to tell workers about workplace hazards. By knowing and understanding workplace hazards, workers can assure that employers communicate all hazards associated with the job, provide appropriate protection and controls, and give training so that employees can work with the smallest possibility of injury or illness.

Apart from just chemical substance hazards, there are also many types of other workplace hazards. **Biological hazards** include HIV-AIDS, Hepatitis A, B and C, and rabies. These can be present in fellow employees or in animals, birds, and insects both in a laboratory setting or the surrounding environment. **Safety hazards** are present in work with machines and equipment, like chainsaws, forklift trucks, ladders and wood working machines. **Physical hazards** include cold, heat, noise, high voltage and vibration that can cause injury and harm to employees. All hazards, whether they be hazardous substances, safety, biological or physical hazards are to be communicated to the employee by their employer prior to work.

The following Hazard Communication Program has been established by Drexel University to ensure compliance with all directives pertinent to the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1200. This program discusses potential chemical-type hazards present in the workplace as well as other hazards such as safety, physical, and biological as they pertain to the Facilities Staff. Its intent is to provide Facilities Management Employees with a reference guide to working with Hazardous Chemicals.

2. DREXEL UNIVERSITY POLICY STATEMENT

It is the desire and the intention of Drexel University to provide a safe and healthful working environment. All reasonable efforts will be made to make every hazardous chemical operation as safe as possible, and to inform employees in accordance to the Hazard Communication Standard and Right to Know Act.

All work units of Drexel University will participate in the Hazard Communication Program. This written program is available in the Safety and Health Department for review by any interested employee.

3. HAZARD COMMUNICATION AND RIGHT TO KNOW: WHAT THE STANDARDS REQUIRE

The regulations require employers to:

- Develop a **written hazard communication program** for their workplace. The program must detail how the regulatory criteria will be met. Hazards, both existing and potential are to be addressed as well as ways to control them. In addition, it also must include a list of known hazardous chemicals in the workplace. Employers must ensure that all hazardous chemicals are labeled or otherwise identified to inform employees of exposure hazards.
- Obtain and ensure that **material safety data sheets (MSDS)** are available to employees exposed to chemical hazards. MSDS sheets should be maintained on site in the Facilities office. Copies of facilities MSDS files and chemical inventories are kept in the Safety & Health Department (Bellet Building, Suite 502).
- Provide employees **information about the standard operations** where chemical hazards are present in the workplace, and the location and availability of the employer's written hazard communication program listing of hazardous chemicals and MSDS.
- Provide employees **information about the standard operations** where all other hazards (safety, biological, physical, etc.) are present in the workplace and actions to take if a related emergency occurs.
- **Train** employees concerning the methods and observations which may be used to detect releases of hazardous chemicals in the workplace, and protective actions available to employees, as well as an explanation of the warning system, (labeling, MSDS, etc.) utilized, and how employees may obtain and utilize the hazard information. Exception – research and development laboratories are treated differently.

For Drexel University Laboratory areas and employees, the Chemical Hygiene Plan is used and followed. This plan is similar in ways to this one; however it is much more detailed and in-depth. Laboratory employees are exposed to various forms of numerous different chemicals on a daily basis. Therefore, a separate program and training was developed for them. For a copy of the Chemical Hygiene Plan, please contact the Drexel University Safety & Health Department at 215-895-5907.

4. RESPONSIBILITIES

A. **Employee's Responsibility**

The Hazard Communication Standard can protect the employee if he/she identifies hazards before starting a job, respects all precautions and does not take chances, asks a supervisor when in doubt and knows in advance what could go wrong and what to do about it. He or she should know how

and where to get help, how to read labels and Material Safety Data Sheets and know how to use correct personal protective clothing and equipment when handling hazardous substances

- B. The following personnel have been designated as responsible for updating and maintaining the hazard communication program, employee training, labeling, and ensuring that MSDS forms are obtained and maintained.

1. **Hazard Communications Program:**

The Director of Safety & Health is the overall Hazard Communications coordinator. Facilities Management Supervisors are responsible for their respective areas.

Filing and maintenance of MSDS is the responsibility of the Facilities Management Supervisor.

2. **Employee Training:**

The Drexel University Safety and Health will conduct training as appropriate.

3. **Labeling on Hazardous substance Containers:**

It will be the responsibility of the Facilities Supervisors to insure proper labeling of containers. This is to be consistent with the information contained in the appropriate MSDS.

4. **Labeling on Shipped Containers:**

It will be the responsibility of shipping to insure all boxes, containers, and cartons, which are suspect of containing chemicals, are appropriately labeled. Shipments that show damage/leak/or spill are to be refused.

5. **Appropriate Signage**

It will be the responsibility of the University Safety & Health Department to assure that all hazardous substances, situations or environments are properly labeled with the appropriate signage to warn employees of the risks involved and what controls need to be taken in order to create safer working conditions.

6. **Obtaining/Maintaining Material Safety Data Sheet (MSDS):**

Facilities Supervisors will be responsible for collecting and maintaining an organized and searchable collection of all MSDS sheets appropriate to the

chemical and or chemical products they use in all aspects of facilities (cleaning crew, woodworking shops, metal shops, paint shops, etc.). They will also insure that the MSDS are kept in a highly visible, central location accessible to all employees.

Hard copies of Facilities MSDS sheets will be kept in the Drexel University's Department of Safety & Health. Inventories shall also be maintained by Facilities Supervisors and copies shall be provided to the Safety & Department.

7. **Informing Contractors:**

It will be the responsibility of Facilities to inform contractors of the hazards in the work area on campus to which they are assigned.

This is critical in any active Laboratory where chemicals/compressed gas is in use or stored. Contractors are to be informed of any restrictions involving use of compressed gasses, flame, or chemicals to be utilized by the contractor as part of the job.

5. **TYPES OF HAZARDS**

A. **Chemical**

1. Physical Hazards of Chemicals

- a. Flammable
- b. Explosive – violent expansion of gases
- c. Reactive – can burn, explode, or release toxic vapor if exposed to other chemicals, heat or water.
- d. Radioactive

2. Health Hazards of Chemicals

- a. Carcinogen – Prolonged exposure may cause cancer
- b. Corrosive – Will burn eyes or skin
- c. Highly Toxic –Chemical is lethal if it enters the body.
- d. Irritant – Causes a reversible inflammatory effect on tissue.
- e. Sensitization – Causes allergic reaction to skin
- f. Toxic – causes illness or sometimes death.

3. Methods of Entry

a. *Inhalation*

Inhalation is the most rapid route of entry that immediately introduces toxic chemicals to respiratory tissues and into the bloodstream. Once in bloodstream, the chemical can be quickly transported to the organs.

b. *Injection*

Caused by laceration of skin with contaminated object (ex. Needle-stick injury)

c. *Ingestion*

Ingestion is a type of entry that is caused by a chemical orally entering into the body. The chemical, either independently or through the action of eating or drinking contaminated food/drink items can enter in this manner.

d. *Absorption* (through skin or other membranes)

Exposure via absorption is of serious concern depending on the part of the body exposed. For instance the male scrotum absorbs material 300 hundred times faster than the palm of a hand. Foreheads about 75 times as fast, fore arms faster than hands but slower than forehead.

4. Evaluating the risk of Chemical Exposure

An employee's chemical exposure is controlled by Occupational Exposure Limits (OEL's). OEL's are airborne concentration limits of substances under which all workers may be repeatedly exposed without adverse effect. There are various classifications of OEL shown below:

- Time Weighted Average (TWA) – exposure over an 8 hour day
- Short Term Exposure Limit (STEL) – exposure over a 15 minute maximum time span
- Ceiling Limit (C) – A limit that should not be exceeded EVER!
- Skin Notation – Potential exposure via skin route

Two most common types of OEL's:

- OSHA Permissible Exposure Limits (PEL's) – These are regulated industry limits that are required to be followed by law.
- ACGIH Threshold Limit Values (TLV's) - Mostly more stringent than OSHA PEL's. They are not regulations, only standards, however are recommended as good work practice by OSHA.

5. Chemical Warning Properties

Some chemicals possess certain properties that warn the user of potential overexposure. These compounds can mostly be detected in air through odor or mild irritation usually at levels below which they are toxic.

Example:

Phenol has an odor threshold of 0.5 ppm and an irritation threshold of 50 ppm. The TLV and PEL for phenol is 5 ppm, as an 8-hr time weighted average (TWA). If a person smells phenol, they are likely approaching the TLV and PEL. If they experience irritation, they are likely exceeding the TLV and PEL.

Remember that individual odor thresholds vary widely for some compounds and that the olfactory system can become fatigued (lose its sense of smell) after short-term exposure to some compounds.

- B. **Biological** - Hazards such as HIV, Hepatitis A, B, C, and rabies that can be present in fellow employees or in animals, birds, and insects. Please refer to the Bloodborne Pathogens Plan available by contacting University Safety & Health at x3632.
- C. **Safety** - Hazards present in work with machines and equipment such as chainsaws, forklifts, trucks, ladders, etc.
- D. **Physical** - Hazards such as cold, heat, noise, electricity and vibration

6. **LABELS**

Labels used by employees of Drexel University provide identification and appropriate warnings for hazardous chemicals. The Director of Safety and Health verifies that all containers received for use will be clearly labeled as to the contents, note the appropriate hazard warning, and list the name and address of the manufacturer.

A. **Primary container label contents**

Primary indicates that container which the product originally was housed in when received from the manufacturer.

1. The identity of the chemical - common name and/or chemical name (no abbreviations!).
2. A hazard warning – such as “Caution, Warning, Flammable, Toxic”, etc.
3. The name and address of the manufacturer or responsible party.

When chemicals are received, check all containers to ensure that the product label meets the requirements outlined above.

If a chemical product is shipped without a label that meets these requirements, contact the supplier immediately to request labels or to arrange return of the chemicals. Do not use the chemicals until proper labels have arrived and been permanently affixed to the primary containers.

B. **Secondary containers**

A secondary container is any container other than the one in which the chemical was received from the supplier that the chemical is transferred into. Secondary container labels are to include all the same information as the label located on the primary container.

It is not necessary to label the secondary container if:

- Only one employee uses the chemical without exposing others, and
- Returns the contents to the original container or disposes of the rest of it in a proper manner (see Section 7 Disposal Methods).
- The container is only used for one shift and is not left unattended in the work area.

C. Stationary Process Containers

Signs, placards, process sheets, batch tickets, operating procedures, etc. are used in lieu of affixed labels, as long as there is identity on specific applicable containers and information containing identity of hazardous chemicals and suitable warnings. Color codes, in accordance with ANSI Z53.1 will also be used on piping.

D. Portable Containers

Labeling is not required when an employee uses a portable container to transfer a hazardous chemical for immediate use. The head of each department will ensure that all secondary containers are labeled with either an extra copy of the original manufacturer's label or with labels that have the identity and appropriate hazard warning. For additional information, contact the Safety & Health Department.

E. Removal of Defacement of Labels

Removal or defacement of existing labels on incoming containers of hazardous chemical is strictly prohibited UNLESS the container is marked immediately with the required information.

F. Language

Labels or warning must be in English and prominently displayed in the container or be readily available in the work area. Information may be translated into other languages for employees, but must always be in English as well.

7. SIGNAGE

Apart from those mentioned above, other types of labels and signs are seen on Drexel University's campus. They include hazard indicator signage/labels, caution and warning signs as well as those explaining personal protective equipment requirements.

A. General Hazard Indicator Signage

As stated above, on all chemical containers and tanks, chemical identification and a hazard warning is to be listed clearly in plain site. However, this wording may not be enough to prevent accidents from occurring could get lost in all the other written

information such as manufacturer's information, etc. Numerous agencies have created various systems to identify hazards associated with a chemical and perhaps even ways to control it all on one separate, highly visible label. The four main types of this sort of labeling systems are identified below:

1. *NFPA*

The National Fire Protection Association has created a system for quickly identifying hazards associated with a particular chemical known as the fire diamond that is outlined in their code NFPA 704 Hazard Identification. The diamond below would be placed on chemical containers for quick identification of hazards.



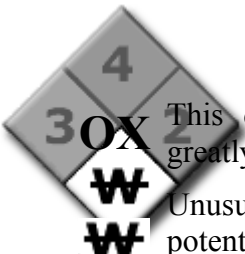
The diamond is broken into four sections. Numbers in the three colored sections range from 0 (least severe hazard) to 4 (most severe hazard). The fourth (white) section is left blank and is used only to denote special fire fighting measures/hazards. The tables below outline in further detail what each number if placed in the appropriate diamond means.

	Health Hazard (Blue)	
	4	Very short exposure could cause death or serious residual injury even though prompt medical attention was given.
	3	Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
	2	Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
	1	Exposure could cause irritation but only minor residual injury even if no treatment is given.
	0	Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

	Flammability (Red)	
	4	Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
	3	Liquids and solids that can be ignited under almost all ambient conditions.
	2	Must be moderately heated or exposed to relatively high temperature before ignition can occur.
	1	Must be preheated before ignition can occur.
	0	Materials that will not burn.

	Instability (Yellow)	
	4	Readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
	3	Capable of detonation or explosive reaction, but requires a strong initiating source or must be heated under confinement before initiation, or reacts explosively with water.
	2	Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.
	1	Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.
	0	Normally stable, even under fire exposure conditions, and are not reactive with water.

¹ Prior to 1996, this section was titled "Reactivity". The name was changed because many people did not understand the distinction between a "reactive hazard" and the "chemical reactivity" of the material. The numeric ratings and their meanings remain unchanged.

	Special Hazards (White)	
	used to denote special hazards. There are only 4 approved symbols: OX This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire. W Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material.	

Other symbols, abbreviations, and words that some organizations use in the white Special Hazards section are shown below. These uses are **not** compliant with NFPA 704, but we present them here in case you see them on an MSDS or container label:

ACID	This indicates that the material is an acid, a corrosive material that has a pH lower than 7.0
ALK	This denotes an alkaline material, also called a base. These caustic materials have a pH greater than 7.0
COR	This denotes a material that is corrosive (it could be either an acid or a base).
	This is another symbol used for corrosive.
	The skull and crossbones is used to denote a poison or highly toxic material. See also: CHIP Danger symbols.
	The international symbol for radioactivity is used to denote radioactive hazards; radioactive materials are extremely hazardous when inhaled.
	Indicates an explosive material. This symbol is somewhat redundant because explosives are easily recognized by their Instability Rating.

* (Tables courtesy of the MSDS Hyper Glossary, <http://www.ilpi.com/msds/ref/nfpa.html>)

2. *Hazardous Materials Identification System*

Another hazard labeling system was developed by the National Paint and Coating Association (NPCA). This is known as the Hazardous Material Identification System (HMIS). It utilizes color codes that correspond to the hazards of a particular product, numeric ratings that indicate severity of the hazard, and alphabetical codes that designate appropriate personal protective equipment (PPE) that should be worn while handling the material.

An example of this system is shown below:



In many respects, the HMIS is very similar to the NFPA. The color and number coding are identical. But instead of the diamond, the HMIS uses a color bar system.

With this system, the white section is used to indicate what level of protective equipment is required. Instead of a numeric hazard ranking as used for the health, flammability and reactivity bars, the level of protective equipment is indicated by a letter. Examples are:

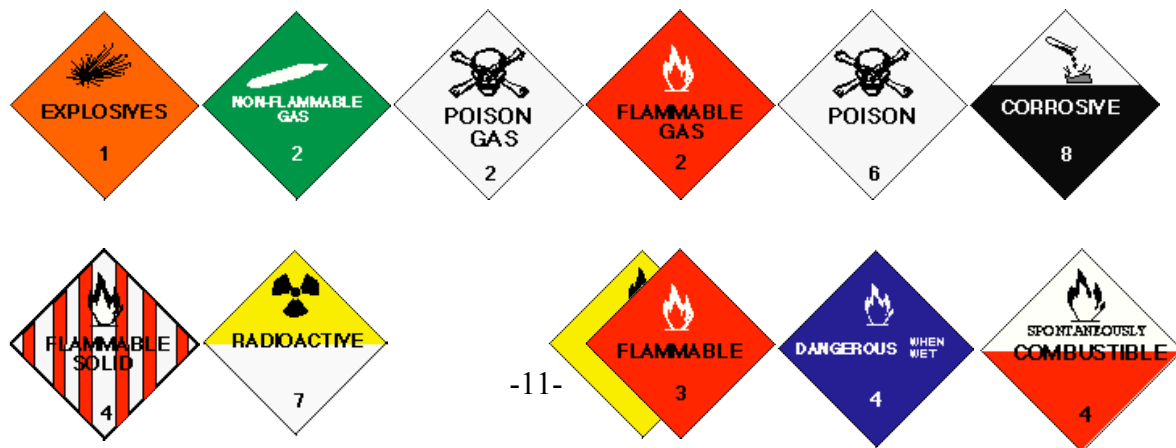
A	safety glasses
B	safety glasses and gloves
C	safety glasses, gloves and an apron
D	face shield, gloves and an apron
E	safety glasses, gloves and a dust respirator
F	safety glasses, gloves, apron and a dust respirator
G	safety glasses, a vapor respirator
H	splash goggles, gloves, apron and a vapor respirator
I	safety glasses, gloves and a dust/vapor respirator
J	splash goggles, gloves, apron and a dust/vapor respirator
K	airline hood or mask, gloves, full suit and boots
L - Z	custom PPE specified by employer

3. Department of Transportation

For chemicals being transported, the Department of Transportation (DOT) has created their own system of labeling for chemical storage containers (DOT Hazardous Material Regulations 49 CFR 100-179). The primary goal of DOT hazard communication is to warn the public and transportation workers of the presence of hazardous materials. It is also used to verify that materials that are not compatible are kept separate from one another. As does the NFPA Fire Diamond and the HMIS sign, the DOT system's provides a highly visual sign for responders to a hazardous material incident.

The DOT uses 4" x 4" colored diamond labels with warning words and graphics, affixed to the outside of the shipping container or box. The DOT requires placards, a much larger version of the labels, to be displayed on tank cars, cargo tanks, portable tanks and bulk packaging. Requirements for placarding are dependent upon the identity and quantity shipped. "Markings" are required to convey specific information about the enclosed hazard and the person responsible.

Examples of labels and placards used by the DOT are below:



4. *Workplace Hazardous Materials Information System (WHMIS)*

The Workplace Hazardous Materials Information System (WHMIS) is Canada's hazard communication standard. Within this standard are regulations regarding labeling hazardous substances. This system is not used often in the United States, however it is listed here as it may be seen on some products.

These placards would be seen on any products that Canada would consider “controlled”. A controlled product is defined as any product that can be included in any of the following 6 classes:

1. Class A Compressed Gas
2. Class B Flammable and Combustible Material
3. Class C Oxidizing Material
4. Class D Poisonous and Infectious Material
5. Class E Corrosive Material
6. Class F Dangerously Reactive Material

Two of the classes, Class B and Class D, are subdivided as follows:

- **Class B Flammable and Combustible Material**

- Division 1 Flammable Gases
- Division 2 Flammable Liquids
- Division 3 Combustible Liquids
- Division 4 Flammable Solids
- Division 5 Flammable Aerosols
- Division 6 Reactive Flammable Materials

- **Class D Poisonous and Infectious Material**

- Division 1** Material Causing Immediate and Serious Toxic Effects

- Subdivision A Very Toxic Material
 - Subdivision B Toxic Material

- Division 2** Materials Causing Other Toxic Effects

- Subdivision A Very Toxic Material
 - Subdivision B Toxic Material

Division 3 Biohazardous Infectious Material

An example of a placard based on this system is below:



B. Labeling on Laboratory Entrance Doors

Signage such as those seen above will be present not only on chemical product containers but also on all laboratory doorways informing entrants of the hazards associated inside. These are to be kept up to date by the laboratory owners and should always be appropriate to the type of hazards located inside.

The laboratory entrance door will be labeled as follows:

1. NFPA diamond. Laboratory personnel shall fill in the diamond with the highest hazard number pertaining to their laboratory.
2. Biohazard label and appropriate Biosafety Level (if applicable).
3. Radiation Hazard Label (if applicable).
4. Emergency contact information. The information should include a name and number to contact in the event of an emergency. It must be clearly visible and placed in one of two locations:
 - a. Outer laboratory door
5. Additional warning labels as applicable, i.e. “carcinogen in use”, “water reactive materials”, “inhalation hazard, respiratory protection required in this area”, “high noise, hearing protection required in this area”, etc.

Below are examples of various stickers and symbols that may be seen on laboratory entry doors:

Radiation Hazard Present in Laboratory:



Biohazard Present in Laboratory:



An example of the labeling system used on Drexel University's Laboratory doors is illustrated on the following page:

LABORATORY EMERGENCY INFORMATION

HEALTH HAZARD 4 Deadly 3 Extreme danger 2 Hazardous 1 Slightly hazardous 0 Normal material	FIRE HAZARD Flash Points 4 Below 73F 3 Below 100F 2 Above 100F not exceeding 200 F 1 Above 200 F 0 Will not burn	REACTIVITY 4 May detonate 3 Shock and heat may detonate 2 Violent chemical change 1 Unstable if heated 0 Stable												
SPECIFIC HAZARD <table style="width: 100%;"> <tr> <td>Oxidizer</td> <td>OX</td> </tr> <tr> <td>Acid</td> <td>ACID</td> </tr> <tr> <td>Alkali</td> <td>ALK</td> </tr> <tr> <td>Corrosive</td> <td>COR</td> </tr> <tr> <td>Use NO WATER</td> <td></td> </tr> <tr> <td>Radioactive</td> <td></td> </tr> </table>			Oxidizer	OX	Acid	ACID	Alkali	ALK	Corrosive	COR	Use NO WATER		Radioactive	
Oxidizer	OX													
Acid	ACID													
Alkali	ALK													
Corrosive	COR													
Use NO WATER														
Radioactive														

Emergency Contact Information

Name	Telephone #
1. _____	_____
2. _____	_____
3. _____	_____

After Hour Contact Number: _____

Department: _____

Telephone: _____ Date Posted: _____

Hazards contained in laboratory:
(Check all that apply)

☐ Radioactives	☐ Explosives
☐ Flammables	☐ Poisons
☐ Oxidizers	☐ Corrosives
☐ High Voltage	☐ LASER
☐ UV Light	☐ Biohazards

C. Labeling on Various Laboratory Equipment

All cabinets, shelves and refrigerators containing chemical storage (including the cleaning supplies) must be labeled with the appropriate warning label (i.e. Flammable, Acids, Bases, Oxidizers etc). Refrigerators used for chemical storage must be labeled, with appropriate hazard warnings and with the signage: "NO Food or Drink – Chemicals Storage Only." Any refrigerator used of food or drink storage must be label as such.

8. DISPOSAL METHODS

The Waste Disposal Program provided at Drexel University for the collection, segregation, storing, transport, and incineration of contaminated materials is designed in accordance with the Pennsylvania Department of Environmental Protection (PADEP), the US Environmental Protection Agency (EPA) and the UIS Department of Transportation (DOT) to minimize possible harm to people, other organisms, and the environment. Refer to the university's hazardous waste management plan for waste removal/disposal operations.

A. Drain Disposal

The University Department of Safety and Health will permit drain disposal of elementary neutralized (pH adjustment of waste that are hazardous only because they exhibit the corrosively characteristic) acidic and caustic aqueous solutions. The elementary neutralized aqueous solution must have a final pH value between 6 and 9. Disposal must not exceed a rate greater that 50 ml. min. while flushing. These compounds should be flushed with at least 10 volumes of excess water.

All drain discharges will be documented on a log sheet near the point of discharge. The log sheet shall contain the date of discharge the chemical name, the volume discharged and the pH value. The University Department of safety and Health will collect the log sheet bimonthly. Each log sheet will be kept in a room specific file for one year.

The University Department of Safety and Health shall prohibit the drain disposal of the following:

- Flammable or explosive pollutants.
- Pollutants that will cause corrosive structural damage to the Publicly Owned Treatment Works (POTW), but in no case discharges with pH lower than 5.0.
- Solid or viscous pollutants that may cause an obstruction of flow in the POTW.
- Pollutants capable of releasing fumes or vapors.
- Pollutants, including oxygen-demanding pollutants (high biological oxygen demand) which may cause interference with the POTW.
- Wastewater with sufficient heat to inhibit biological activity in the POTW (must not exceed 104 F at the POTW)
- Petroleum, oil, non-biodegradable cutting oil or products of mineral oil origin in amounts that will cause interference or pass through.
- No organic chemicals

- No heavy metal solutions.

B. Incineration

Incineration, in an environmentally acceptable manner is the most practical disposal method for combustible waste. Indiscriminate disposal by pouring waste chemicals down the drain or adding them to mixed refuse for landfill burial is unacceptable.

C. Hoods and recycling

Chemical fume hoods are not to be used as a means of disposal for volatile chemicals. Disposal by recycling or chemical decontamination must be used whenever possible.

9. MATERIAL SAFETY DATA SHEETS (MSDS)

Drexel University must provide pertinent information regarding identity, nature, control and treatment of chemical hazards. This is satisfied with a Material Safety Data Sheet (MSDS – in accordance with OSHA’s Hazard Communication Standard, 29 CFR 1910.1200 (g) and section 4 (b) 3 of the Worker and Community Right to Know Act). A separate MSDS must be maintained, in English for each substance. MSDS sheets are to be kept and maintained in the Facilities area by Facilities supervisors with copies stored in the Safety and Health Department. Material Safety Data Sheets provide:

- A. Identity (including chemical and common names) of substance, manufacturer, degree of hazard it present, etc.
- B. Mixture ingredients, each chemical ingredient in a mixture, its percentage in the mix and the types of hazard (irritant, toxic, etc.) it presents. If an exposure limit has been established, it must be given.
 1. **PEL** (Permissible Exposure Level) is the level accepted by OSHA.
 2. **TLV** (Threshold Limit Value) is the level established by the American Conference of Governmental Industrial Hygienists (ACGIH).
 3. There may be other limits issued. If the limits differ, then the lowest recommended level is the one that should be followed.
- C. The physical and chemical characteristics of the substance, including the melting and boiling points, evaporation rate, vapor pressure and density, solubility in water, and appearance and odor.
- D. Fire and explosion hazard data, including the flash point of the substance, flammable limits, and special fire fighting equipment and procedures.

- E. Reactivity, the condition of the substance, whether it is stable or unstable and situations to keep it away to prevent reaction.
- F. The acute and chronic health hazards associated with the chemical, its routes of entry into the body, target organs (whether through the skin, inhalation, injection or ingestion), carcinogenicity (cancer causing), and signs and symptoms of exposure such as:
- Eye irritation
 - Skin rash
 - Nausea
 - Headache
 - Dizziness
 - Existing medical conditions that could be aggravated by exposure

Emergency first aid procedures, and exposure limits set by OSHA and the American Conference of Governmental Industrial Hygienists (ACGIH) and possible carcinogens listed by OSHA, the National Toxicology Program or the International Agency for Research in Cancer (IARC).

- G. The precautions for safe handling and use of the chemical, such as steps to be taken in case the material is released or spilled, waste disposal methods, and precautions to be taken in storage.
- H. Control measures needed to protect employees from exposure to the chemical. These measures include personal protective equipment (respirators, gloves, etc.); engineering controls (ventilation, etc.) and work practices.
- I. Spills, leaks and disposal
1. What to do if the substance spills or leaks
 2. How to dispose of the substance
 3. Equipment leaks and procedures needed for cleaning up spills and leaks.

10. EMERGENCY SITUATIONS

A. Major Spills in Research Labs

In the event of a major spill (500 ml or an acutely hazardous material) in a university area, all personnel will implement the following plan

- Notify persons in the immediate area that a spill has occurred
- Avoid breathing vapors, mists or dust of the spilled material
- Turn off all ignition sources if possible
- Evacuate room and close door
- Contact 24 hour call center at x2222 (215-895-2222)
 - Be prepared to provide the following information:

- Name and call back number
- The location of the spill (building and room number)
- Type of material spilled
- The amount of material that spilled

B. Minor Spills in Research Labs (>500mL or 500 grams)

In the event of a minor spill occurring while working in any of areas listed below the following emergency procedures shall be implemented:

1. *Occupied Laboratories*
 - Laboratory personnel will be responsible for the containment and clean up of all minor spills.
2. *Education and Vacant Laboratories*
 - All minor spills occurring in vacant laboratories, education/prep laboratories, or any other university area shall be considered a major spill. Therefore, anyone observing a minor spill in these areas shall implement the major spill procedures.
3. *Discovery of an Unknown Spill*

If personnel shall come across a spill of an unknown nature, the following steps shall be taken:

 - Notify persons in the immediate area that a spill has occurred. They may be aware of spill or know the nature of the spill
 - Avoid breathing vapors, mists or dust of the spilled material
 - Turn off all ignition sources if possible
 - Evacuate room and close door
 - Contact 24 hour call center at x2222 (215-895-2222)
 - Be prepared to provide the following information:
 - Name and call back number
 - The location of the spill (building and room number)
 - Type of material spilled
 - The amount of material that spilled

C. Facilities Related Spills

Spills occurring from Facilities work operations (paint spill, cleaning supplies, oil spill etc.) shall be treated the same as major spills:

- Notify persons in the immediate area that a spill has occurred
- Avoid breathing vapors, mists or dust of the spilled material
- Turn off all ignition sources
- Evacuate room and close door if applicable
- Contact 24 hour call center at x2222 (215-895-2222)
 - Be prepared to provide the following information:
 - Name and call back number

- The location of the spill (building and room number)
- Type of material spilled
- The amount of material that spilled

D. Chemical Exposures

- | | |
|------------------|---|
| a. Eye Contact: | Promptly flush eyes with water for a prolonged period (15 minutes), obtain information from MSDS and report to Employee/Student Health or nearest emergency room for evaluation. |
| b. Ingestion | Call Emergency Operator (9-911), Poison Control Center or Chemtrec. Do not induce vomiting or drink large quantities of water unless directed to do so by a medical professional. |
| c. Skin Contact: | Promptly flush the affected area with water for 15 minutes. Remove all contaminated clothing. Use a safety shower when contact is extensive. |

NOTE: In any of the above events, seek medial advice immediately. Phone or contact Drexel Security (215) 895-2222 and the University Department of Safety & Health at (215) 895-5907.

11. PRECAUTIONS

Being part of the facilities management team, you will be asked to venture into almost every part of Drexel University's campus. This includes laboratory work spaces. Special precautions, not only in how you do your general daily work tasks, but also how you proceed to accomplish your work tasks in laboratory settings need to be taken. Below are precautions that need to be taken when working in a laboratory area that may contain numerous hazardous substances and situations.

A. Laboratory Area Precautions

- Prior notice is to be given to occupants of the laboratory whenever work is to be completed in their areas. This will allow them to take any special precautions in order to keep you, themselves, as well as their work safe during activity.
- An initial survey of the area prior to project commencement should be taken at all times before working in a laboratory setting or a setting of unknown hazards.
- When working in a laboratory setting, proper personal protective equipment is to be worn at all times. Closed toed shoes, safety glasses, proper gloves as well as pants (short pants will be allowed for facilities employees) and a shirt should be worn as *basic* protective equipment. Safety goggles, hearing protection, face shields,

respiratory protection, etc. may be needed dependant on the area and the type of work being performed.

- Always be aware of the environment and the processes occurring in the area. Be cautious at all times and try to not make sudden movements as most laboratories contain hundreds of bottles of chemicals that could be knocked over. When possible, have all chemical containers moved away from the area that you are working in.

The following precautions are to be taken no matter the work environment.

B. Work Area Precautions

- Keep all work areas clean and free of clutter. Clean up the work area on completion of an operation or at the end of each work shift or class.
- Keep chemicals and equipment properly labeled and stored appropriately. Segregate chemical as noted in Part 9 of this section. (For more information on Compatible Storage, refer to Appendix E).
- Do not store, handle or consume food or beverages in laboratory areas, refrigerators or with glassware or utensils that are also used for laboratory operation.
- Seek information and advice about hazards, review MSDS (www.hazard.com) plan appropriate protective procedures and plan positioning of equipment before beginning new operation.
- Leave lights on during work hours.
- Provide for containment of toxic substances in the event of failure of a utility service in an unattended operation.
- Do not smell or taste chemicals
- Use equipment only for its designed purpose

C. Toxic Chemical Precautions

- Review the Material Safety Data Sheets prior to working with any toxic chemicals.
- Do not allow the release of toxic substances into re-circulated atmospheres. Use only in well outdoor-ventilated areas.
- Proper gloves and appropriate personal protective equipment (i.e. face shields, safety glasses, safety goggles, respirators, etc.) should always be worn when working with toxic chemicals. Contact the University Safety & Health Department for assistance or glove selection.

- After using toxic materials, facilities personnel shall wash his or her face, hands, neck and arms prior to leaving the work area if possible. If not possible, wash as soon as feasible.

D. Flammable Material Precautions

- Handle flammable substances only in areas free of ignition sources. Besides open flames, ignition sources include electrical equipment (especially motors), static electricity, and, for some materials (e.g. carbon disulfide), even hot surfaces.
- Check the work area for flames or ignition sources prior to using a flammable substance.
- Never heat a flammable substance with an open flame. Preferred heat sources include steam heating mantles and hot air.
- Keep containers of flammable substances tightly closed at all times when not in use.
- Apply for hot work permit when working with flammable substances.
- Use only refrigeration equipment certified for storage of flammable materials.

12. TRADE SECRETS

Some hazardous chemicals used by Drexel University may be “trade secret”. For these hazardous substances where the manufacturer has a trade secret ingredient, the manufacturer must reveal the “trade secret” identity in case of medical emergency. In non-emergency situations, Drexel University or an employee may make a written request with explanation of need for “trade secret” information. Emergency telephone numbers for manufacturers appear on the Material Safety Data Sheet.

13. EMPLOYEE INFORMATION AND TRAINING

Drexel University will inform and train its employees about the hazardous chemicals used in its workplace, as a supplement to the written Hazard Communication Program, in the following ways:

- Background and requirements of the Hazard Communication Plan.
- Where the University’s written Hazard Communication Program lists of chemicals and Material Safety Data Sheets are retained.
- The meaning of the information found on container labels and Material Safety Data Sheets.

- Ways to use the information that is provided on container labels and Material Safety Data Sheets.
- Question and answer period.
- Communicate Right to Know requirements: safety resources available to employees (who to call) and safety reference bibliography. Also provide a sample Material Safety Data Sheet, a label sample and a copy of the hazardous chemical list for each department being trained. Each trainer will refer directly to his/her department's list of substances.

14. NON-ROUTINE TASKS

(Information distribution to employees during non-routine situations)

Periodically, employees are required to perform hazardous non-routine tasks e.g. confined space entry or tank cleaning. Prior to starting work on such projects, each affected employee will be given information by his supervisor about the hazardous chemicals he/she may encounter during such activity.

This information will include specific chemical hazards, protective equipment, safety measures the employee can use, and steps the company is using to reduce the hazards, including ventilation, respirators, presence of another employee and emergency procedures.

Employees assigned to non-routine tasks and hazards associated with chemicals contained in unlabeled pipes in their work areas shall be fully advised prior to the onset of the job by their immediate supervisor. This information can be in verbal or written form.

15. OUTSIDE CONTRACTORS

(Information distribution to outside contractors relating to piping, chemicals and training)

The contractor shall provide appropriate barriers, warning signs, etc. and take all precautions necessary to protect life and property and shall comply with all current OSHA and EPA safety regulations as well as Drexel University's safety policies.

The contractor is advised to visit the job site prior to bidding for the purpose of verifying all conditions. Necessary plans and specification will be supplied to the contractor by Drexel University.

16. MULTI-EMPLOYER WORKPLACES

All purchase orders and Drexel University contracts will contain the following information/statements:

- “In compliance with 29 CFR 1910.1200, Drexel University maintains a Hazard Communication Program for contractor employees.”
- “The Safety and Health Department should be contacted at 210-895-5907, to determine if there is any possible exposure to your employees.”

APPENDIX A

GLOSSARY

Biological Hazard – Any hazard of a biological nature such as HIV-AIDS, Hepatitis A, B and C, and rabies. These can be present in fellow employees or in animals, birds, and insects both in a laboratory setting or the surrounding environment.

Chemical – any element, chemical compound and/or mixture.

Common Name – any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name

Container - any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems are not considered to be containers.

Designated Representative – any individual or organization to which an employee gives written authorization to exercise such employee's rights.

Distributor – a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to a manufacturing purchaser.

Employee (Hazard Communication Standard) – a worker who may be exposed to hazardous chemicals under normal operating conditions or foreseeable emergencies.

Employer (Hazard Communication Standard) – A person engaged in a business where chemicals are either used, or are produced for use or distribution, including a contractor or subcontractor.

Exposure or Exposed – any time an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.) and includes potential (e.g. accidental or possible exposure)

Foreseeable Emergencies – any potential occurrence such as, but not limited to, equipment failure, rupture of container, or failure of control equipment, which could result in an uncontrolled release of a hazardous chemical into the workplace.

Hazard Warning – any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazards of the chemical in the container.

Hazardous Chemical – any chemical, which is a physical or a health hazard

Health Hazard – a chemical for which there is statistically significant evidence principles that acute or chronic health effects may occur in exposed employees. The term “health hazard” includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxin, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematologist system and agents which damage the lungs, skin eyes or mucous membranes.

Identity – any chemical or common name, which is indicated on the Material Safety Data Sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

Label – any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Major Spill – any spill involving 500 ml or an acutely hazardous material

Material Safety Data Sheets (MSDS) – written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of the Hazard Communication Standard or Section 4 of the Worker and Community Right to Know Act.

Minor Spill - Any spill that involves <500 ml of non-acutely hazardous material.

Physical Hazard – a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, and organic peroxide, and oxidizer, pyrophoric, unstable (reactive) or water reactive.

(or)

Environmental hazards such as cold, heat, noise, high voltage and vibration.

Safety Hazard – Those hazards present in the workplace in which adequate precautions can be taken to prevent against injury. They typically occur in a workplace setting that includes machines and equipment, like chainsaws, forklift trucks, ladders and wood working machines.

Work Area - a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

APPENDIX B

COMMONLY ASKED QUESTIONS AND ANSWERS

Below are a few of the most frequently asked questions concerning the Hazard communication/Right-to-Know rule:

1. What is the origin of Hazard Communication?

The Hazard Communication rule had its genesis in 1974 when the Standards Advisory Committee was formed to develop guidelines to implement Section 6 (B)7 of the Occupational Safety and Health Act. During the same year, NIOSH (National Institute for Occupational Safety & Health) issued a proposed rule "Hazards Identification" which would have required a label on all hazardous chemicals that contained the common chemical name, the Chemical Abstracts Service number (CAS#) and an appropriate hazard warning. This resulted in a new OSHA right to know rule entitled "Hazard Communication", published in the November 25th, 1983 Federal Register. The interval between initial action on the rule and its final promulgation led some state and local governments to formulate their own regulations. The Commonwealth of Pennsylvania passed their own Worker and Community Right to Know Act in 1984 to make available to employees and to the general public the identity of chemicals used in the workplace, and to make information available as to the known or suspected health hazards posed by the use of or exposure to hazardous substances.

2. What was the date of full compliance?

The final phase of the OSHA's Hazard Communication Standards went into effect on April 25th 1988.

3. To whom is the Hazard Communication Standard & Right to Know Act Applicable?

- *Chemical manufacturers*
- *Importers*
- *All employees*
- *Distributors*

4. What is included in the Hazard Communication Standard and Right to Know Act?

- A. *Workplace chemicals to which employees are exposed either routinely or in a foreseeable emergency.*
- B. *Laboratory chemicals (under certain limitations)*
 - a. *No defacing/removal of labels on incoming containers*
 - b. *Maintenance/accessibility of MSDS's of incoming hazardous materials*
 - c. *Information and training that is provided per requirements*

5. What chemicals are exempt for Hazard Communication Standard & Right to Know Act?

- *Pesticides when subject to labeling requirements and regulations*
- *Food*
- *Food additives*
- *Drugs*
- *Cosmetics – regulated by FDA*
- *Distilled spirits*
- *Wine*
- *Malt beverages*
- *Consumer products containing hazardous substances (Consumer Product Safety)*
- *Hazardous waste (EPA regulations)*
- *Tobacco*
- *Tobacco products*

- *Wood/wood products*

6. Are all chemical exposures harmful?

No. Chemicals are a part of our lives. Modern life would be impossible without chemicals. Plastics, drugs and miracle fibers are just a few of the things that use chemicals in their manufacture. But chemicals have to be treated with respect too. Many can cause injury or illness if not handled properly.

7. What are Material Safety Data Sheets?

Material Safety Data Sheets are information documents about chemicals, their hazards and required protective and emergency measures.

8. How is air sampling used to reveal things about safety and health?

OSHA and the American Conference of Governmental Industrial Hygienists both published exposure limits that indicate the maximum of a substance that a person may breathe in a given period of time, without suffering ill effects.

9. Do all chemicals cause cancer?

No. If a chemical has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or a potential carcinogen or if it is listed in the latest edition of the Annual Report on Carcinogen or if it is regulated by OSHA as a carcinogen, then these chemicals may cause cancer (29 CFR part 1910, subpart 2, Toxic and Hazardous Substances, OSHA).

10. What is the difference between acute and chronic effects?

Acute effects occur rapidly as the result of short-term exposure, regardless of their severity. Chronic effects usually occur over a long duration and may not manifest except after long-term exposure.

APPENDIX C

PERSONAL DECONTAMINATION PROCEDURES

If injured or contaminated with a hazardous substance these procedures will be implemented **immediately** prior to cleaning up or reporting spill.

- For spills contacting the of skin, follow these procedures:
 1. Immediately flush with flowing water for no less than 15 minutes (i.e. sink or safety shower).
 2. If there is no visible burn, wash with warm water and soap, removing any jewelry to facilitate clearing of any residual material.
 3. Check the material safety data sheet to see if any delayed effects should be expected. If the MSDS is not available contact University Department of Safety and Health immediately.
 4. Seek medical attention for even minor chemical burns.
 5. Do not use creams, lotions, or salves.
- For spills on clothing, follow these procedures:
 1. Do not attempt to wipe the clothes.
 2. Quickly remove all contaminated clothing, shoes, and jewelry while using the safety shower.
 3. Seconds count, so do not waste time because of modesty
 4. Take care not to spread the chemical on the skin or, especially, in the eyes.
 5. Use caution when removing pullover shirts or sweaters to prevent contamination of the eyes; it may be better to cut the garments off.
 6. Immediately flood the affected body area with warm water for no less than 15 minutes. Resume if pain returns.
 7. Get medical attention as soon as possible. Discard contaminated clothes as hazardous waste or have them laundered separately from other clothing.
- For splashes into the eye, take these steps:
 1. Using the eyewash immediately flush for at least 15 minutes.
 2. Hold the eyelids away from the eyeball, and move the eye up and down and sideways to wash thoroughly behind the eyelids.
Get medical attention immediately. Follow first aid by prompt treatment by a member of a medical staff or an ophthalmologist who is acquainted with chemical injuries.

APPENDIX D

EPA EXTREMELY HAZARDOUS SUBSTANCES LIST (40 CFR 355)

Acetone Cyanohydrin
Acetone Thiosemicarbazide
Acrolein
Acrylamide
Acrylonitrile
Acrylyl Chloride
Adiponitrile
Aldicarb
Aldrin
Allyl Alcohol
Allylamine
Aluminum Phosphide
Aminopterin
Amiton
Amiton Oxalate
Ammonia
Amphetamine
Aniline
Aniline, 2,4,6-Trimethyl-
Antimony Pentafluoride
Antimycin A
ANTU
Arsenic Pentoxide
Arsenous Oxide
Arsine
Azinphos-Ethyl
Azinphos-Methyl
Benzal Chloride
Benzenamine, 3-(Trifluoromethyl)-
Benzene, 1-(Chloromethyl)-4-Nitro-
Benzenearsonic Acid
Benzimidazole, 4,5-Dichloro-2-(Trifluoromethyl)- Benzotrichloride
Benzyl Chloride
Benzyl Cyanide
Bicyclo[2,2,1]Heptane-2-Carbonitrile,
5-Chloro-6-(((Methylamino)Carbonyl)Oxy)Imino)-, (1s-(1-alpha, 2-beta, 4-alpha, 5-alpha, 6E))-
Bis(Chloromethyl)Ketone
Bitoscanate
Boron Trichloride
Boron Trifluoride
Boron Trifluoride Compound with Methyl Ether (1:1) Bromadiolone
Bromine
Butadiene
Butyl Vinyl Ether
Cadmium Oxide
Cadmium Stearate
Calcium Arsenate
Camphechlor
Cantharidin
Carbachol Chloride
Carbamic Acid, Methyl-,

O-(((2,4-Dimethyl-1,3-Dithiolan-2-yl)Methylene)Amino)- Carbofuran
 Carbon Disulfide
 Carbophenothion
 Chlordane
 Chlorfenvinfos
 Chlorine
 Chlormephos
 Chlormequat Chloride
 Chloroacetic Acid
 Chloroethanol
 Chloroethyl Chloroformate
 Chloroform
 Chloromethyl Ether
 Chloromethyl Methyl Ether
 Chlorophacinone
 Chloroxuron
 Chromic Chloride
 Cobalt, ((2,2'-(1,2-Ethanediy)bis (Nitrilomethylidyne)) Bis(6-Fluorophenolato))(2-)-N,N',O,O')-
 Cobalt Carbonyl
 Colchicine
 Coumaphos
 Coumatetralyl
 Cresol, o-
 Crimidine
 Crotonaldehyde
 Crotonaldehyde, (E)-
 Cyanogen Bromide
 Cyanogen Iodide
 Cyanuric Fluoride
 Cycloheximide
 Cyclohexylamine
 Decarborane(14)
 Demeton
 Demeton-S-Methyl
 Dialifor
 Diborane
 Dichloroethyl Ether
 Dichloromethylphenylsilane
 Dichlorovos
 Dicrotophos
 Diepoxybutane
 Diethyl Chlorophosphate
 Diethylcarbamazine Citrate
 Digitoxin
 Digoxin
 Diglycidyl Ether
 Dimefox
 Dimethoate
 Dimethyl Phosphorochloridothioate
 Dimethyl Sulfate
 Dimethyl Sulfide
 Dimethyldichlorosilane
 Dimethylhydrazine
 Dimethyl-p-Phenylenediamine
 Dimetilan
 Dinitroresol

Dinoseb
Dinoterb
Dioxathion
Diphacinone
Diphosphoramidate, Octamethyl-
Disulfoton
Dithiazanine Iodide
Dithiobiuret
Emetine, Dihydrochloride
Endosulfan
Endothion
Endrin
Epichlorohydrin
EPN
Ergocalciferol
Ergotamine Tartrate
Ethanesulfonyl Chloride, 2-Chloro-
Ethanol, 1,2-Dichloro-, Acetate
Ethion
Ethoprophos
Ethylbis(2-Chloroethyl)Amine
Ethylene Fluorohydrin
Ethylene Oxide
Ethylenediamine
Ethyleneimine
Ethylthiocyanate
Fenamiphos
Fenitrothion
Fensulfothion
Fluometil
Fluorine
Fluoroacetamide
Fluoroacetic Acid
Fluoroacetyl Chloride
Fluorouracil
Fonofos
Formaldehyde
Formaldehyde Cyanohydrin
Formetanate Hydrochloride
Formothion
Formparanate
Fosthietan
Fuberidazole
Furan
Gallium Trichloride
Hexachlorocyclopentadiene
Hexamethylenediamine, N,N'-Dibutyl-
Hydrazine
Hydrocyanic Acid
Hydrogen Chloride (Gas Only)
Hydrogen Fluoride
Hydrogen Peroxide (Concentration greater than 52%) Hydrogen Selenide
Hydrogen Sulfide
Hydroquinone
Iron, Pentacarbonyl-
Isobenzan

Isobutyronitrile
Isocyanic Acid, 3,4-Dichlorophenyl Ester
Isodrin
Isofluorophate
Isophorone Diisocyanate
Isopropyl Chloroformate
Isopropyl Formate
Isopropylmethylpyrazolyl Dimethylcarbamate
Lactonitrile
Lepthophos
Lewisite
Lindane
Lithium Hydride
Malononitrile
Manganese, Tricarbonyl Methylcyclopentadienyl Mechlorethamine
Mephosfolan
Mercuric Acetate
Mercuric Chloride
Mercuric Oxide
Methacrolein Diacetate
Methacrylic Anhydride
Methacrylonitrile
Methacryloyl Chloride
Methacryloyloxyethyl Isocyanate
Methamidophos
Methanesulfonyl Fluoride
Methidathion
Methiocarb
Methomyl
Methoxyethylmercuric acetate
Methyl 2-Chloroacrylate
Methyl Bromide
Methyl Chloroformate
Methyl Disulfide
Methyl Hydrazine
Methyl Isocyanate
Methyl Isothiocyanate
Methyl Mercaptan
Methyl Phenkapton
Methyl Phosphonic Dichloride
Methyl Thiocyanate
Methyl Vinyl Ketone
Methylmercuric Dicyanamide
Methyltrichlorosilane
Metolcarb
Mevinphos
Mexacarbate
Mitmycin C
Monocrotophos
Muscimol
Mustard Gas
Nickel Carbonyl
Nicotine
Nicotine Sulfate
Nitric Acid
Nitric Oxide

Nitrobenzene
 Nitrocyclohexane
 Nitrogen Dioxide
 Nitrosodimethylamine
 Norbormide
 Organorhodium Complex
 Ouaban
 Oxamyl
 Oxetane, 3,3-Bis(Chloromethyl)-
 Oxydisulfoton
 Ozone
 Paraquat
 Paraquat Methosulfate
 Parathion
 Paris Green
 Pentaborane
 Pentachlorophenol
 Pentadecylamine
 Peracetic Acid
 Perchloromethylmercaptan
 Phenol
 Phenol, 2,2'-Thiobis(4,6-Dichloro-
 Phenol, 2,2'-Thiobis(4-Chloro-6-Methyl-Phenol, 2,2'-Thiobis(4-Chloro-6-Methyl)-
 Phenol, 3-(1-Methylethyl)-. Methylcarbamate
 Phenoxarsine, 10,10'-Oxydi-
 Phenyl Dichloroarsine
 Phenylhydrazine Hydrochloride
 Phenylmercury Acetate
 Phenylsilatrane
 Phenylthiourea
 Phorate
 Phosacetim
 Phosfolan
 Phosgene
 Phosmet
 Phosphamidon
 Phosphine
 Phosphonothioic Acid, Methyl-,O-Ethyl O-(4-(Methylthio) Phenyl) Ester
 Phosphonothioic Acid, Methyl-S-(2-(Bis(1-Methylethyl) Amino Ethyl O-Ethyl Ester
 Phosphonothioic Acid, Methyl-O-(4-Nitrophenyl) O-Phenyl Ester Phosphoric Acid, Dimethyl 4-(Methylthio)
 Phenyl Ester Phosphorothioic Acid, O,O-Dimethyl-S-(2-Methylthio) Ethyl Ester Phosphorus
 Phosphorus Oxychloride
 Phosphorus Pentachloride
 Phosphorus Pentoxide
 Phosphorus Trichloride
 Physostigmine
 Physostigmine, Salicylate (1:1)
 Picrotoxin
 Piperidine
 Piprotal
 Pirimifos-Ethyl
 Potassium Arsenite
 Potassium Cyanide
 Potassium Silver Cyanide
 Promecarb
 Propargyl Bromide

Propiolactone, Beta-
Propionitrile
Propionitrile, 3-Chloro-
Propiophenone, 4-Amino-
Propyl Chloroformate
Propylene Oxide
Propyleneimine
Prothcate
Pyrene
Pyridine, 2-Methyl-5-Vinyl-
Pyridine, 4-Amino-
Pyridine, 4-Nitro-, 1-Oxide
Pyriminil
Salcomine
Sarin
Selenious Acid
Selenium Oxychloride
Semicarbazide Hydrochloride
Silane, (4-Aminobutyl)Diethoxymethyl-
Sodium Arsenate
Sodium Arsenite
Sodium Azide
Sodium Cacodylate
Sodium Cyanide
Sodium Fluoroacetate
Sodium Pentachlorophenate
Sodium Selenate
Sodium Selenite
Sodium Tellurite
Stannane, Acetoxytriphenyl-
Strychnine
Strychnine, Sulfate
Sulfotep
Sulfoxide, 3-Chloropropyl Octyl
Sulfur Dioxide
Sulfur Tetrafluoride
Sulfur Trioxide
Tabun
Tellurium
Tellurium Hexafluoride
TEPP
Terbufos
Tetraethyllead
Tetraethyltin
Tetramethyllead
Tetranitromethane
Thallium Sulfate
Thallous Carbonate
Thallous Chloride
Thallous Malonate
Thallous Sulfate
Thiocarbazide
Thiofanox
Thionazin
Thiophenol
Thiosemicarbazide

Thiourea, (2-Chlorophenyl)-
 Thiourea, (2-Methylphenyl)-
 Titanium Tetrachloride
 Toluene 2,4-Diisocyanate
 Toluene 2,6-Diisocyanate
 Trans-1,4-Dichlorobutene
 Triamiphos
 Triazofos
 Trichloroacetyl Chloride
 Trichloroethylsilane
 Trichloronate
 Trichlorophenylsilane
 Trichloro(Chloromethyl)Silane
 Trichloro(Dichlorophenyl)Silane
 Triethoxysilane
 Trimethylchlorosilane
 Trimethylpropane Phosphite
 Trimethyltin Chloride
 Triphenyltin Chloride
 Tris(2-Chloroethyl)Amine
 Valinomycin
 Vanadium Pentoxide
 Vinyl Acetate Monomer
 Warfarin
 Warfarin Sodium
 Xylylene Dichloride
 Zinc, Dichloro(4,4-Dimethyl-5((((Methylamino) Carbonyl)Oxy)Imino)Pentanenitrile-, (T-4)-
 Zinc Phosphide

APPENDIX E

ACUTELY HAZARDOUS MATERIAL

P LIST

Hazardous TOXIC CHEMICALS

Waste No. Substance

P023	Acetaldehyde, chloro
P002	Acetamide, N-(aminothioxomethyl)
P057	Acetamide, 2-fluoro
P058	Acetic acid, fluoro-, sodium salt
P002	1-Acetyl-2-thiourea
P003	Acrolein
P070	Aldicarb
P203	Aldicarb sulfone.
P004	Aldrin
P005	Allyl alcohol
P006	Aluminum phosphide (R,T)
P007	5-(Aminomethyl)-3-isoxazolol
P008	4-Aminopyridine
P009	Ammonium picrate (R)
P119	Ammonium vanadate
P099	Argentate(1-), bis(cyano-C)-, potassium
P010	Arsenic acid H ₃ AsO ₄
P012	Arsenic Oxide As ₂ O ₃
P011	Arsenic oxide As= OS
P011	Arsenic pentoxide
P012	Arsenic trioxide
P038	Arsine, diethyl
P036	Arsonous dichloride, phenyl
P054	Aziridine
P067	Aziridine, 2-methyl
P013	Barium cyanide
P024	Benzenamine, 4-chloro
P077	Benzenamine, 4-nitro
P028	Benzene, (chloromethyl)-
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)
P046	Benzeneethanamine, alpha,alpha-dimethyl
P014	Benzenethiol
P127	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate
P188	Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-

tdmethylpyrrolo[2,3

2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations

P001	
P028	Benzyl chloride
P015	Beryllium powder
P017	Bromoacetone
P018	Brocine
P045	2-Butanone, 3,3-dimethyl-1-(methylthio)-,
P021	Calcium cyanide
P021	Calcium cyanide Ca(CN):
P189	Carbamic acid, [(dibutylamino)- thio]methyl-, 2,3-dihydro-2,2-dimethyl- 7-benzofuranyl ester
P191	Carbamic acid, dimethyl-, 1-[(dimethyl-amino)carbonyl]- 5-methyl-1H- pyrazol-3-yl ester.
P192	Carbamic acid, dimethyl-, 3-methyl-1- (1-methylethyl)-1H- pyrazol-5-yl ester.
P190	Carbamic acid, methyl-, 3-methylphenyl ester.
P127	Carbofuran.
P022	Carbon disulfde
P095	Carbonic dichloride
P189	Carbosulfan.
P023	Chloroacetaldehyde
P024	p-Chloroaniline
P026	1-(o-Chlorophenyl)thiourea
P027	3-Chloropropionitrile
P029	Copper cyanide
P029	Copper cyanide Cu(CN)
P202	m-Cumenyl methylcarbamate.
P030	Cyanides (soluble cyanide salts), not otherwise specified
P031	Cyanogen
P033	Cyanogen chloride
P033	Cyanogen chloride (CN)CI
P034	2-Cyclohexyl-4,6-dinitrophenol
P016	Dichloromethyl ether
P036	Dichlorophenylarsine
P037	Dieldrin
P038	Diethylarsine
P041	Diethyl-p-nitrophenyl phosphate
P040	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	Diisopropylfluorophosphate (DFP)
P004	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a; hexahydro-.
	(talpha,4alpha,4abeta,5alpha,8alpha,8abeta)
PO60	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a-hexahydro-,
	(ialpha,4a]pha,4abeta,5beta,8beta.8abeta)

P037	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,ea,7,7a-octahydro-(1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta, 7aalpha)
P051	(1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta, 7aalphay, & metabolites
P044	Dimethoate
P046	alpha, alpha-Dimethylphenethylamine
P191	Dimetilan.
P047	4,6-Dinitro-o-cresol, & salts
P048	2,4-Dinitrophenol
P020	Dinoseb
P085	Diphosphoramidate, octamethyl
P711	Diphosphoric acid, tetraethyl ester
P039	Disulfoton
P049	Dithiobiuret
P785	1,3-Dithiolane-2carboxaldehyde, 2,4-dimethyl-, O- [(methylamino)- carbonyl]oxime.
P050	Endosulfan
P088	Endothall
P051	Endrin
P051	Endrin, & metabolites
P042	Epinephrine
P031	Ethanedinitrile
P194	Ethanimidothioic acid, 2-(dimethylamino)-N-[[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester.
P066	Ethanimidothioic acid,
P701	Ethyl cyanide
P054	Ethyleneimine
P097	Famphur
P056	Fluorine
P057	Fluoroacetamide
P058	Fluoroacetic acid, sodium salt
P798	Formetanate hydrochloride.
P197	Formparanate.
P065	Fulminic acid, mercury(2+) salt (R,T)
P059	Heptachlor
P062	Hexaethyltetraphosphate
P116	Hydrazinecarbothioamide
P068	Hydrazine, methyl
P063	Hydrocyanic acid
P063	Hydrogen cyanide
P096	Hydrogen phosphide
P060	Isodrin
P192	Isolan.

P202	3-Isopropylphenyl N-methylcarbamate.
P007	3(2H)-Isoxazolone, 5-(aminomethyl)
P196	Manganese, bis(dimethylcarbamodithioato-S,S')-,
P196	Manganese dimethyldithiocarbamate.
P092	Mercury, (acetato-0)phenyl
P065	Mercury fulminate (R,T)
P082	Methanamine, N-methyl-N-nitroso
P064	Methane, isocyanato
P016	Methane, oxybis[chloro
P712	Methane, tetranitro- (R)
P118	Methanethiol, trichloro
P798	
P197	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[(methylamino)carbonyl]oxy]phenyl]
P050	6,9-Methano-2.4,3-benzodioxathiepin, 6,7,8,9,10,10
P059	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro
P199	Melhiocarb.
P066	Methomyl
P068	Methyl hydrazine
P064	Methyl isocyanate
P069	2-Methylactonitrile
P071	Methyl parathion
P790	Metolcarb.
P128	Mexacarbate.
P072	alpha-Naphthylthiourea
P073	Nickel carbonyl
P073	Nickel carbonyl Ni(CO) ₄ , (T-4)
P074	Nickel cyanide
P074	Nickel cynaide Ni(CN):
P075	Nicotine, & salts
P076	Nitric oxide
P077	p-Nitroaniline
P078	Nitrogen dioxide
P076	Nitrogen oxide NO
P078	Nitrogen oxide NO,
P081	Nitroglycerine (R)
P082	N-Nitrosodimethylamine
P084	N-Nitrosomethylvinylamine
P085	Octamethylpyrophosphoramide
P087	Osmium oxide OsO ₄ , (T-4)
P087	Osmium tetroxide
P088	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid

P794	Oxamyl.
P089	Parathion
P034	Phenol, 2-cyclohexyl-4,6-dinitro
P048	Phenol, 2,4-dinitro
P047	Phenol, 2-methyl-4,6-dinitro-, 8 salts
P020	Phenol, 2-(1-methylpropyl)-4,6-dinitro
P009	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P128	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester).
P199	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate
P202	Phenol, 3-(1-methylethyl)-, methyl carbamate.
P201	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate.
P092	Phenylmercury acetate
P093	Phenylthiourea
P094	Phorate
P095	Phosgene
P096	Phosphine
P041	Phosphoric acid, diethyl 4-nitrophenyl ester
P039	Phosphorodithioic acid, 0,0-diethyl
P094	Phosphorodithioic acid, 0,0-diethyl
P044	Phosphorodithioic acid, 0,0-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P043	Phosphorofluondic acid, bis(1-methylethyl) ester
P089	Phosphorothioic acid, 0,0-diethyl O-(4-nitrophenyl) ester
P040	Phosphorothioic acid, 0,0-diethyl O-pyrazinyl ester
P097	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] 0,0-dimethyl ester
P071	Phosphorothioic acid, 0,0.-dimethyl O-(4-nitrophenyl) ester
P204	Physostigmine.
P188	Physostigmine salicylate.
Pilo	Plumbane, tetraethyl
P098	Potassium cyanide
P098	Potassium cyanide K(CN)
P099	Potassium silver cyanide
P201	Promecarb
P070	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P203	Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime.
P101	Propanenitrile
P027	Propanenitrile, 3-chloro
P069	Propanenitrile, 2-hydroxy-2-methyl
P081	1,2,3-Propanetdol, trinitrate (R)
P017	2-Propanone, 1-bromo
P102	Propargyl alcohol
P003	2-Propenal

P005	2-Propen-1-ol
P0671,	2-Propylenimine
P102	2-Propyn-1-ol
P008	4-Pyridinamine
P075	Pyridine, 3-(1-methyl-2-pyrrolidiny)-, (S)-, 8 salts
P204	
P114	Selenious acid, dilhallium(1+) salt
P104	Silver cyanide
P104	Silver cyanide Ag(CN)
P105	Sodium azide
P106	Sodium cyanide
P106	Sodium cyanide Na(CN)
P108	Strychnidin-10-one, & salts
P018	Strychnidin-10-one, 2,3-dimethoxy
P108	Strychnine, & salts
P115	Sulfuric acid, dithallium(1+) salt
P109	Tetraethyldithiopyrophosphate
P110	Tetraethyl lead
P111	Tetraethyl pyrophosphate
P112	Tetranilromethane (R)
P062	Tetraphosphoric acid, hexaethyl ester
P113	Thallic oxide
P713	Thallium oxide Tl ₂ O,
P114	Thallium(I) selenite
P115	Thallium(I) sulfate
P109	Thiodiphosphoric acid, tetraethyl ester
P045	Thiofanox
P049	Thioimidodicarbonic diamide [(H= N)C(S)I= NH
P014	Thiophenol
P116	Thiosemicarbazide
P026	Thiourea, (2-chlorophenyl)
P072	Thiourea, 1-naphthalenyl
P093	Thiourea, phenyl
P185	Tirpate.
P123	Toxaphene
P118	Trichloromethanethiol
P119	Vanadic acid, ammonium salt
P120	Vanadium oxide V ₂ O ₅
P120	Vanadium pentoxide
P084	Vinylamine, N-methyl-N-nitroso
P103	Selenourea

P001	Warfarin, & salts, when present at concentrations greater than 0.3
P205	Zinc, bis(dimethylcarbamodithioalo-S,S')-,
P121	Zinc cyanide
P121	Zinc cyanide $\text{Zn}(\text{CN})_2$
P122	Zinc phosphide Zn_3P_2 , when present at concentrations greater than 10% (R,T)
P205	Ziram
U007	Acrylamide
U135	Hydrogen sulfide
U135	Hydrogen sulfide H_2S
U151	Mercury
U188	Phenol
See F027	2,4,5-T
U207	1,2,4,5-Tetrachlorobenzene
U208	1,1,1,2-Tetrachloroethane
U209	1,1,2,2-Tetrachloroethane
U210	Tetrachloroethylene
See F027	2,3,4,6-Tetrachlorophenol

APPENDIX F

Related and Compatible Storage Groups

Inorganic Family	Nitric acid, other inorganic acids
Metals, hydrides	Sulfur, phosphorus, arsenic, phosphorus pentoxide
Halides, sulfates, sulfites, thiosulfates, phosphates, halogens	Organic Family
Amides, nitrates (except ammonium nitrate), nitrites, azides	Acids, anhydrides, peracids
Hydroxides, oxides, silicates, carbonates, carbon	Alcohols, glycols amines, amides, imines, imides
Sulfides, selenides, phosphides, carbides, nitrides	Hydrocarbons, esters, aldehydes
Chlorates, perchlorates, perchloric acid, chlorites, hypochlorites, peroxides, hydrogen peroxide	Ethers, ketones, ketenes, halogenated hydrocarbons, ethylene oxide
Arsenates, cyanides, cyanates	Peroxides, hydroperoxides, azides
Borates, chromates, manganates, Permanganates	Sulfides, polysulfides, sulfoxides, Nitrites
	Phenols, cresols

NOTE: Store flammables in a storage cabinet for flammable liquids or in safety cans.

Separate chemicals into their organic and inorganic families and then related and compatible groups, as shown. Separation of chemical groups can be by different shelves within the same cabinet.

Do NOT store chemicals alphabetically as a general group. This may result in incompatibles appearing together on a shelf. Rather, store alphabetically within compatible groups.

This listing is only a suggested method of arranging chemical materials for storage and is not intended to be complete.

APPENDIX G

OSHA 29 CFR 1910.100 TABLE Z-1 LIMITS FOR AIR CONTAMINANTS

NOTE: Because of the length of the table, explanatory Footnotes applicable to all substances are given below as well as at the end of the table. Footnotes specific only to a limited number of substances are also shown within the table.

Footnote(1) The PELs are 8-hour TWAs unless otherwise noted; a (C) designation denotes a ceiling limit. They are to be determined from breathing-zone air samples.

Footnote(a) Parts of vapor or gas per million parts of contaminated air by volume at 25 degrees C and 760 torr.

Footnote(b) Milligrams of substance per cubic meter of air. When entry is in this column only, the value is exact; when listed with a ppm entry, it is approximate.

Footnote(c) The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than one metal compound measured as the metal, the CAS number for the metal is given - not CAS numbers for the individual compounds.

Footnote(d) The final benzene standard in 1910.1028 applies to all occupational exposures to benzene except in some circumstances the distribution and sale of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures; for the excepted subsegments, the benzene limits in Table Z-2 apply. See 1910.1028 for specific circumstances.

Footnote(e) This 8-hour TWA applies to respirable dust as measured by a vertical elutriator cotton dust sampler or equivalent instrument. The time-weighted average applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning and willowing) and garnetting. See also 1910.1043 for cotton dust limits applicable to other sectors.

Footnote(f) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.

Footnote(2) See Table Z-2.

Footnote(3) See Table Z-3

Footnote(4) Varies with compound.

TABLE Z-1. - LIMITS FOR AIR CONTAMINANTS

Substance	CAS No. (c)	ppm (a) (1)	mg/m(3) (b) (1)	Skin designation
Acetaldehyde.....	75-07-0	200	360	
Acetic acid.....	64-19-7	10	25	
Acetic anhydride.....	108-24-7	5	20	
Acetone.....	67-64-1	1000	2400	
Acetonitrile.....	75-05-8	40	70	
2-Acetylaminofluorene; see 1910.1014.....	53-96-3			
Acetylene dichloride; see 1,2-Dichloroethylene.				
Acetylene tetrabromide.	79-27-6	1	14	
Acrolein.....	107-02-8	0.1	0.25	
Acrylamide.....	79-06-1	.....	0.3	X
Acrylonitrile; see 1910.1045.....	107-13-1			
Aldrin.....	309-00-2	.....	0.25	X
Allyl alcohol.....	107-18-6	2	5	X
Allyl chloride.....	107-05-1	1	3	
Allyl glycidyl ether... (AGE).....	106-92-3	(C) 10	(C) 45	
Allyl propyl disulfide.	2179-59-1	2	12	
alpha-Alumina.....	1344-28-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Aluminum Metal (as Al)..	7429-90-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
4-Aminodiphenyl; see 1910.1011.....	92-67-1			
2-Aminoethanol; see Ethanolamine.....				
2-Aminopyridine.....	504-29-0	0.5	2	
Ammonia.....	7664-41-7	50	35	
Ammonium sulfamate.....	7773-06-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
n-Amyl acetate.....	628-63-7	100	525	
sec-Amyl acetate.....	626-38-0	125	650	
Aniline and homologs...	62-53-3	5	19	X
Anisidine (o-,p-isomers).....	29191-52-4	.....	0.5	X
Antimony and compounds (as Sb).....	7440-36-0	.....	0.5	
ANTU (alpha Naphthylthiourea)....	86-88-4	.....	0.3	
Arsenic, inorganic compounds (as As); see 1910.1018.....	7440-38-2			
Arsenic, organic compounds (as As)....	7440-38-2	.....	0.5	

Arsine.....	7784-42-1	0.05	0.2	
Asbestos;				
see 1910.1001.....	(4)			
Azinphos-methyl.....	86-50-0	.....	0.2	X
Barium, soluble				
compounds (as Ba)....	7440-39-3	.....	0.5	
Barium sulfate.....	7727-43-7			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Benomyl.....	17804-35-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Benzene; See 1910.1028.	71-43-2			
See Table Z-2 for				
the limits				
applicable in the				
operations or				
sectors excluded				
in 1910.1028(d)				
Benzidine;				
See 1910.1010.....	92-87-5			
p-Benzoquinone;				
see Quinone.				
Benzo(a)pyrene; see				
Coal tar pitch				
volatiles.....				
Benzoyl peroxide.....	94-36-0	.....	5	
Benzyl chloride.....	100-44-7	1	5	
Beryllium and				
beryllium compounds				
(as Be).....	7440-41-7		(2)	
Biphenyl; see Diphenyl.				
Bismuth telluride,				
Undoped.....	1304-82-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Boron oxide.....	1303-86-2			
Total dust.....		.....	15	
Boron trifluoride.....	7637-07-2	(C) 1	(C) 3	
Bromine.....	7726-95-6	0.1	0.7	
Bromoform.....	75-25-2	0.5	5	X
Butadiene				
(1,3-Butadiene); See				
29 CFR 1910.1051;	106-99-0	1 ppm/5		
29 CFR 1910.19(1)....		ppm STEL		
Butanethiol;				
see Butyl mercaptan.				
2-Butanone				
(Methyl ethyl ketone)	78-93-3	200	590	
2-Butoxyethanol.....	111-76-2	50	240	X
n-Butyl-acetate.....	123-86-4	150	710	
sec-Butyl acetate.....	105-46-4	200	950	
tert-Butyl-acetate.....	540-88-5	200	950	
n-Butyl alcohol.....	71-36-3	100	300	
sec-Butyl alcohol.....	78-92-2	150	450	
tert-Butyl alcohol.....	75-65-0	100	300	
Butylamine.....	109-73-9	(C) 5	(C) 15	X

tert-Butyl chromate (as CrO(3)).....	1189-85-1	.....	(C) 0.1	X
n-Butyl glycidyl ether (BGE).....	2426-08-6	50	270	
Butyl mercaptan.....	109-79-5	10	35	
p-tert-Butyltoluene....	98-51-1	10	60	
Cadmium (as Cd); see 1910.1027.....	7440-43-9			
Calcium Carbonate.....	1317-65-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Calcium hydroxide.....	1305-62-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Calcium oxide.....	1305-78-8	.....	5	
Calcium silicate.....	1344-95-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Calcium sulfate.....	7778-18-9			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Camphor, synthetic.....	76-22-2	.....	2	
Carbaryl (Sevin).....	63-25-2	.....	5	
Carbon black.....	1333-86-4	.....	3.5	
Carbon dioxide.....	124-38-9	5000	9000	
Carbon disulfide.....	75-15-0		(2)	
Carbon monoxide.....	630-08-0	50	55	
Carbon tetrachloride...	56-23-5		(2)	
Cellulose.....	9004-34-6			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Chlordane.....	57-74-9	.....	0.5	X
Chlorinated camphene...	8001-35-2	.....	0.5	X
Chlorinated diphenyl oxide.....	55720-99-5	.....	0.5	
Chlorine.....	7782-50-5	(C) 1	(C) 3	
Chlorine dioxide.....	10049-04-4	0.1	0.3	
Chlorine trifluoride...	7790-91-2	(C) 0.1	(C) 0.4	
Chloroacetaldehyde.....	107-20-0	(C) 1	(C) 3	
a-Chloroacetophenone (Phenacyl chloride)...	532-27-4	0.05	0.3	
Chlorobenzene.....	108-90-7	75	350	
o-Chlorobenzylidene malononitrile.....	2698-41-1	0.05	0.4	
Chlorobromomethane.....	74-97-5	200	1050	
2-Chloro-1,3-butadiene; See beta-Chloroprene.				
Chlorodiphenyl (42% Chlorine) (PCB)...	53469-21-9	.....	1	X
Chlorodiphenyl (54% Chlorine) (PCB)...	11097-69-1	.....	0.5	X
1-Chloro-2, 3-epoxypropane; See Epichlorohydrin.				
2-Chloroethanol; See Ethylene chlorohydrin				
Chloroethylene;				

See Vinyl chloride.				
Chloroform				
(Trichloromethane)...	67-66-3	(C) 50	(C) 240	
bis(Chloromethyl)				
ether; see 1910.1008.	542-88-1			
Chloromethyl methyl				
ether; see 1910.1006.	107-30-2			
1-Chloro-1-nitropropane	600-25-9	20	100	
Chloropicrin.....	76-06-2	0.1	0.7	
beta-Chloroprene.....	126-99-8	25	90	X
2-Chloro-6				
(trichloromethyl)				
pyridine.....	1929-82-4			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Chromic acid and				
chromates (as CrO(3))	(4)		(2)	
Chromium (II) compounds				
(as Cr).....	7440-47-3	.....	0.5	
Chromium (III)				
compounds (as Cr)....	7440-47-3	.....	0.5	
Chromium metal and				
insol. salts (as Cr)..	7440-47-3	.....	1	
Chrysene; see Coal tar				
pitch volatiles.....				
Clopidol.....	2971-90-6			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Coal dust (less than				
5% SiO(2)),				
respirable fraction..			(3)	
Coal dust (greater than				
or equal to 5%				
SiO(2)), respirable				
fraction.....			(3)	
Coal tar pitch				
volatiles (benzene				
soluble fraction),				
anthracene, BaP,				
phenanthrene,				
acridine, chrysene,				
pyrene.....	65966-93-2	.....	0.2	
Cobalt metal, dust,				
and fume (as Co)....	7440-48-4	.....	0.1	
Coke oven emissions;				
see 1910.1029.....				
Copper.....	7440-50-8			
Fume (as Cu).....		.....	0.1	
Dusts and mists				
(as Cu).....		.....	1	
Cotton dust (e),				
see 1910.1043.....		.....	1	
Crag herbicide (Sesone)	136-78-7			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Cresol, all isomers....	1319-77-3	5	22	X
Crotonaldehyde.....	123-73-9	2	6	

	4170-30-3				
Cumene.....	98-82-8	50	245		X
Cyanides (as CN).....	(4)	.....	5		X
Cyclohexane.....	110-82-7	300	1050		
Cyclohexanol.....	108-93-0	50	200		
Cyclohexanone.....	108-94-1	50	200		
Cyclohexene.....	110-83-8	300	1015		
Cyclopentadiene.....	542-92-7	75	200		
2,4-D (Dichlorophen- oxyacetic acid).....	94-75-7	.....	10		
Decaborane.....	17702-41-9	0.05	0.3		X
Demeton (Systox).....	8065-48-3	.....	0.1		X
Diacetone alcohol (4-Hydroxy-4-methyl- 2-pentanone).....	123-42-2	50	240		
1,2-Diaminoethane; see Ethylenediamine..					
Diazomethane.....	334-88-3	0.2	0.4		
Diborane.....	19287-45-7	0.1	0.1		
1,2-Dibromo-3- chloropropane (DBCP); see 1910.1044.....	96-12-8				
1,2-Dibromoethane; see Ethylene dibromide...					
Dibutyl phosphate.....	107-66-4	1	5		
Dibutyl phthalate.....	84-74-2	.....	5		
o-Dichlorobenzene.....	95-50-1	(C) 50	(C) 300		
p-Dichlorobenzene.....	106-46-7	75	450		
3,3'-Dichlorobenzidine; see 1910.1007.....	91-94-1				
Dichlorodifluoromethane	75-71-8	1000	4950		
1,3-Dichloro-5, 5-dimethyl hydantoin.	118-52-5	.....	0.2		
Dichlorodiphenyltri- chloroethane (DDT)...	50-29-3	.....	1		X
1,1-Dichloroethane.....	75-34-3	100	400		
1,2-Dichloroethane; see Ethylene dichloride..					
1,2-Dichloroethylene...	540-59-0	200	790		
Dichloroethyl ether....	111-44-4	(C) 15	(C) 90		X
Dichloromethane; see Methylene chloride...					
Dichloromonofluoro- methane.....	75-43-4	1000	4200		
1,1-Dichloro-1- nitroethane.....	594-72-9	(C) 10	(C) 60		
1,2-Dichloropropane; see Propylene dichloride.					
Dichlorotetrafluoro- ethane.....	76-14-2	1000	7000		
Dichlorvos (DDVP).....	62-73-7	.....	1		X
Dicyclopentadienyl iron Total dust.....	102-54-5	.....	15		
Respirable fraction..		.....	5		
Dieldrin.....	60-57-1	.....	0.25		X
Diethylamine.....	109-89-7	25	75		

2-Diethylaminoethanol..	100-37-8	10	50	X
Diethyl ether;				
see Ethyl ether.....				
Difluorodibromomethane.	75-61-6	100	860	
Diglycidyl ether (DGE)..	2238-07-5	(C) 0.5	(C) 2.8	
Dihydroxybenzene;				
see Hydroquinone.....				
Diisobutyl ketone.....	108-83-8	50	290	
Diisopropylamine.....	108-18-9	5	20	X
4-Dimethylaminoazo-				
benzene;				
see 1910.1015.....	60-11-7			
Dimethoxymethane;				
see Methylal.....				
Dimethyl acetamide.....	127-19-5	10	35	X
Dimethylamine.....	124-40-3	10	18	
Dimethylaminobenzene;				
see Xylidine.....				
Dimethylaniline				
(N,N-Dimethylaniline)	121-69-7	5	25	X
Dimethylbenzene;				
see Xylene.....				
Dimethyl-1,2-dibromo-2,				
2-dichloroethyl				
phosphate.....	300-76-5	.....	3	
Dimethylformamide.....	68-12-2	10	30	X
2,6-Dimethyl-4-				
heptanone; see				
Diisobutyl ketone....				
1,1-Dimethylhydrazine..	57-14-7	0.5	1	X
Dimethylphthalate.....	131-11-3	.....	5	
Dimethyl sulfate.....	77-78-1	1	5	X
Dinitrobenzene				
(all isomers).....			1	X
(ortho).....	528-29-0			
(meta).....	99-65-0			
(para).....	100-25-4			
Dinitro-o-cresol.....	534-52-1	.....	0.2	X
Dinitrotoluene.....	25321-14-6	.....	1.5	X
Dioxane				
(Diethylene dioxide)..	123-91-1	100	360	X
Diphenyl (Biphenyl)....	92-52-4	0.2	1	
Diphenylmethane				
diisocyanate; see				
Methylene bisphenyl				
isocyanate.....				
Dipropylene glycol				
methyl ether.....	34590-94-8	100	600	X
Di-sec octyl phthalate				
(Di-(2-ethylhexyl)				
phthalate).....	117-81-7	.....	5	
Emery.....	12415-34-8			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Endrin.....	72-20-8	.....	0.1	X
Epichlorohydrin.....	106-89-8	5	19	X
EPN.....	2104-64-5	.....	0.5	X

1,2-Epoxypropane; see				
Propylene oxide.....				
2,3-Epoxy-1-propanol;				
see Glycidol.....				
Ethanethiol; see				
Ethyl mercaptan.....				
Ethanolamine.....	141-43-5	3	6	
2-Ethoxyethanol				
(Cellosolve).....	110-80-5	200	740	X
2-Ethoxyethyl acetate				
(Cellosolve acetate)..	111-15-9	100	540	X
Ethyl acetate.....	141-78-6	400	1400	
Ethyl acrylate.....	140-88-5	25	100	X
Ethyl alcohol (Ethanol)	64-17-5	1000	1900	
Ethylamine.....	75-04-7	10	18	
Ethyl amyl ketone				
(5-Methyl-3-				
heptanone).....	541-85-5	25	130	
Ethyl benzene.....	100-41-4	100	435	
Ethyl bromide.....	74-96-4	200	890	
Ethyl butyl ketone				
(3-Heptanone).....	106-35-4	50	230	
Ethyl chloride.....	75-00-3	1000	2600	
Ethyl ether.....	60-29-7	400	1200	
Ethyl formate.....	109-94-4	100	300	
Ethyl mercaptan.....	75-08-1	(C) 10	(C) 25	
Ethyl silicate.....	78-10-4	100	850	
Ethylene chlorohydrin..	107-07-3	5	16	X
Ethylenediamine.....	107-15-3	10	25	
Ethylene dibromide.....	106-93-4		(2)	
Ethylene dichloride				
(1,2-Dichloroethane)..	107-06-2		(2)	
Ethylene glycol				
dinitrate.....	628-96-6	(C) 0.2	(C) 1	X
Ethylene glycol methyl				
acetate; see Methyl				
cellosolve acetate...				
Ethyleneimine;				
see 1910.1012.....	151-56-4			
Ethylene oxide;				
see 1910.1047.....	75-21-8			
Ethylidene chloride;				
see 1,1-Dichlorethane				
N-Ethylmorpholine.....	100-74-3	20	94	X
Ferbam.....	14484-64-1			
Total dust.....		.....	15	
Ferrovanadium dust.....	12604-58-9	.....	1	
Fluorides (as F).....	(4)	.....	2.5	
Fluorine.....	7782-41-4	0.1	0.2	
Fluorotrichloromethane				
(Trichloro-				
fluoromethane).....	75-69-4	1000	5600	
Formaldehyde;				
see 1910.1048.....	50-00-0			
Formic acid.....	64-18-6	5	9	
Furfural.....	98-01-1	5	20	X
Furfuryl alcohol.....	98-00-0	50	200	

Grain dust (oat, wheat barley).....	.....	.....	10	
Glycerin (mist).....	56-81-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Glycidol.....	556-52-5	50	150	
Glycol monoethyl ether; see 2-Ethoxyethanol..				
Graphite, natural respirable dust.....	7782-42-5		(3)	
Graphite, synthetic....				
Total dust.....		.....	15	
Respirable Fraction..		.....	5	
Guthion; see Azinphos methyl..				
Gypsum.....	13397-24-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Hafnium.....	7440-58-6	.....	0.5	
Heptachlor.....	76-44-8	.....	0.5	X
Heptane (n-Heptane)....	142-82-5	500	2000	
Hexachloroethane.....	67-72-1	1	10	X
Hexachloronaphthalene..	1335-87-1	.....	0.2	X
n-Hexane.....	110-54-3	500	1800	
2-Hexanone (Methyl n-butyl ketone).....	591-78-6	100	410	
Hexone (Methyl isobutyl ketone).....	108-10-1	100	410	
sec-Hexyl acetate.....	108-84-9	50	300	
Hydrazine.....	302-01-2	1	1.3	X
Hydrogen bromide.....	10035-10-6	3	10	
Hydrogen chloride.....	7647-01-0	(C) 5	(C) 7	
Hydrogen cyanide.....	74-90-8	10	11	X
Hydrogen fluoride (as F).....	7664-39-3		(2)	
Hydrogen peroxide.....	7722-84-1	1	1.4	
Hydrogen selenide (as Se).....	7783-07-5	0.05	0.2	
Hydrogen sulfide.....	7783-06-4		(2)	
Hydroquinone.....	123-31-9	.....	2	
Iodine.....	7553-56-2	(C) 0.1	(C) 1	
Iron oxide fume.....	1309-37-1	.....	10	
Isomyl acetate.....	123-92-2	100	525	
Isomyl alcohol (primary and secondary).....	123-51-3	100	360	
Isobutyl acetate.....	110-19-0	150	700	
Isobutyl alcohol.....	78-83-1	100	300	
Isophorone.....	78-59-1	25	140	
Isopropyl acetate.....	108-21-4	250	950	
Isopropyl alcohol.....	67-63-0	400	980	
Isopropylamine.....	75-31-0	5	12	
Isopropyl ether.....	108-20-3	500	2100	
Isopropyl glycidyl ether (IGE).....	4016-14-2	50	240	
Kaolin.....	1332-58-7			
Total dust.....		.....	15	

Respirable fraction..		.....	5	
Ketene.....	463-51-4	0.5	0.9	
Lead inorganic (as Pb);				
see 1910.1025.....	7439-92-1			
Limestone.....	1317-65-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Lindane.....	58-89-9	.....	0.5	X
Lithium hydride.....	7580-67-8	.....	0.025	
L.P.G. (Liquified				
petroleum gas).....	68476-85-7	1000	1800	
Magnesite.....	546-93-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Magnesium oxide fume...	1309-48-4			
Total Particulate....		.....	15	
Malathion.....	121-75-5			
Total dust.....		.....	15	X
Maleic anhydride.....	108-31-6	0.25	1	
Manganese compounds				
(as Mn).....	7439-96-5	.....	(C) 5	
Manganese fume (as Mn)..	7439-96-5	.....	(C) 5	
Marble.....	1317-65-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Mercury (aryl and				
inorganic) (as Hg)....	7439-97-6		(2)	
Mercury (organo) alkyl				
compounds (as Hg)....	7439-97-6		(2)	
Mercury (vapor) (as Hg)	7439-97-6		(2)	
Mesityl oxide.....	141-79-7	25	100	
Methanethiol;				
see Methyl mercaptan.				
Methoxychlor.....	72-43-5			
Total dust.....		.....	15	
2-Methoxyethanol;				
(Methyl cellosolve)..	109-86-4	25	80	X
2-Methoxyethyl acetate				
(Methyl cellosolve				
acetate).....	110-49-6	25	120	X
Methyl acetate.....	79-20-9	200	610	
Methyl acetylene				
(Propyne).....	74-99-7	1000	1650	
Methyl acetylene				
propadiene mixture				
(MAPP).....		1000	1800	
Methyl acrylate.....	96-33-3	10	35	X
Methylal				
(Dimethoxy-methane)..	109-87-5	1000	3100	
Methyl alcohol.....	67-56-1	200	260	
Methylamine.....	74-89-5	10	12	
Methyl amyl alcohol;				
see Methyl Isobutyl				
carbinol.....				
Methyl n-amyl ketone...	110-43-0	100	465	
Methyl bromide.....	74-83-9	(C) 20	(C) 80	X
Methyl butyl ketone;				

see 2-Hexanone.....					
Methyl cellosolve;					
see 2-Methoxyethanol.					
Methyl cellosolve					
acetate;					
see 2-Methoxyethyl					
acetate.....					
Methyl chloride.....	74-87-3		(2)		
Methyl chloroform					
(1,1,1-Trichloro-					
ethane).....	71-55-6	350	1900		
Methylcyclohexane.....	108-87-2	500	2000		
Methylcyclohexanol.....	25639-42-3	100	470		
o-Methylcyclohexanone..	583-60-8	100	460		X
Methylene chloride.....	75-09-2		(2)		
Methyl ethyl ketone					
(MEK); see 2-Butanone					
Methyl formate.....	107-31-3	100	250		
Methyl hydrazine					
(Monomethyl					
hydrazine).....	60-34-4	(C) 0.2	(C) 0.35		X
Methyl iodide.....	74-88-4	5	28		X
Methyl isoamyl ketone..	110-12-3	100	475		
Methyl isobutyl					
carbinol.....	108-11-2	25	100		X
Methyl isobutyl ketone;					
see Hexone.....					
Methyl isocyanate.....	624-83-9	0.02	0.05		X
Methyl mercaptan.....	74-93-1	(C) 10	(C) 20		
Methyl methacrylate....	80-62-6	100	410		
Methyl propyl ketone;					
see 2-Pentanone.....					
alpha-Methyl styrene...	98-83-9	(C) 100	(C) 480		
Methylene bisphenyl					
isocyanate (MDI).....	101-68-8	(C) 0.02	(C) 0.2		
Mica; see Silicates....					
Molybdenum (as Mo).....	7439-98-7				
Soluble compounds....		.....	5		
Insoluble Compounds					
Total dust.....		.....	15		
Monomethyl aniline.....	100-61-8	2	9		X
Monomethyl hydrazine;					
see Methyl hydrazine.					
Morpholine.....	110-91-8	20	70		X
Naphtha (Coal tar).....	8030-30-6	100	400		
Naphthalene.....	91-20-3	10	50		
alpha-Naphthylamine;					
see 1910.1004.....	134-32-7				
beta-Naphthylamine;					
see 1910.1009.....	91-59-8				
Nickel carbonyl (as Ni)	13463-39-3	0.001	0.007		
Nickel, metal and					
insoluble compounds					
(as Ni).....	7440-02-0	.....	1		
Nickel, soluble					
compounds (as Ni)....	7440-02-0	.....	1		
Nicotine.....	54-11-5	.....	0.5		X

Nitric acid.....	7697-37-2	2	5	
Nitric oxide.....	10102-43-9	25	30	
p-Nitroaniline.....	100-01-6	1	6	X
Nitrobenzene.....	98-95-3	1	5	X
p-Nitrochlorobenzene...	100-00-5	.....	1	X
4-Nitrodiphenyl; see 1910.1003.....	92-93-3			
Nitroethane.....	79-24-3	100	310	
Nitrogen dioxide.....	10102-44-0	(C) 5	(C) 9	
Nitrogen trifluoride...	7783-54-2	10	29	
Nitroglycerin.....	55-63-0	(C) 0.2	(C) 2	X
Nitromethane.....	75-52-5	100	250	
1-Nitropropane.....	108-03-2	25	90	
2-Nitropropane.....	79-46-9	25	90	
N-Nitrosodimethylamine; see 1910.1016				
Nitrotoluene (all isomers).....		5	30	X
o-isomer.....	88-72-2			
m-isomer.....	99-08-1			
p-isomer.....	99-99-0			
Nitrotrichloromethane; see Chloropicrin.....				
Octachloronaphthalene..	2234-13-1	.....	0.1	X
Octane.....	111-65-9	500	2350	
Oil mist, mineral.....	8012-95-1	.....	5	
Osmium tetroxide (as Os).....	20816-12-0	.....	0.002	
Oxalic acid.....	144-62-7	.....	1	
Oxygen difluoride.....	7783-41-7	0.05	0.1	
Ozone.....	10028-15-6	0.1	0.2	
Paraquat, respirable dust.....	4685-14-7	.....	0.5	X
	1910-42-5			
	2074-50-2			
Parathion.....	56-38-2	.....	0.1	X
Particulates not otherwise regulated (PNOR) (f).....				
Total dust.....		.....	15	
Respirable fraction..		.....	5	
PCB; see Chlorodiphenyl (42% and 54% chlorine).....				
Pentaborane.....	19624-22-7	0.005	0.01	
Pentachloronaphthalene..	1321-64-8	.....	0.5	X
Pentachlorophenol.....	87-86-5	.....	0.5	X
Pentaerythritol.....	115-77-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Pentane.....	109-66-0	1000	2950	
2-Pentanone (Methyl propyl ketone).....	107-87-9	200	700	
Perchloroethylene (Tetrachloroethylene)	127-18-4		(2)	
Perchloromethyl mercaptan.....	594-42-3	0.1	0.8	

Perchloryl fluoride....	7616-94-6	3	13.5	
Petroleum distillates (Naphtha) (Rubber Solvent).....		500	2000	
Phenol.....	108-95-2	5	19	X
p-Phenylene diamine....	106-50-3	.....	0.1	X
Phenyl ether, vapor....	101-84-8	1	7	
Phenyl ether-biphenyl mixture, vapor.....		1	7	
Phenylethylene; see Styrene.....				
Phenyl glycidyl ether (PGE).....	122-60-1	10	60	
Phenylhydrazine.....	100-63-0	5	22	X
Phosdrin (Mevinphos)...	7786-34-7	.....	0.1	X
Phosgene (Carbonyl chloride).....	75-44-5	0.1	0.4	
Phosphine.....	7803-51-2	0.3	0.4	
Phosphoric acid.....	7664-38-2	.....	1	
Phosphorus (yellow)....	7723-14-0	.....	0.1	
Phosphorus pentachloride.....	10026-13-8	.....	1	
Phosphorus pentasulfide	1314-80-3	.....	1	
Phosphorus trichloride.	7719-12-2	0.5	3	
Phthalic anhydride.....	85-44-9	2	12	
Picloram.....	1918-02-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Picric acid.....	88-89-1	.....	0.1	X
Pindone (2-Pivalyl-1, 3-indandione).....	83-26-1	.....	0.1	
Plaster of paris.....	26499-65-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Platinum (as Pt).....	7440-06-4			
Metal.....		.....	.....	
Soluble Salts.....		.....	0.002	
Portland cement.....	65997-15-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Propane.....	74-98-6	1000	1800	
beta-Propriolactone; see 1910.1013.....	57-57-8			
n-Propyl acetate.....	109-60-4	200	840	
n-Propyl alcohol.....	71-23-8	200	500	
n-Propyl nitrate.....	627-13-4	25	110	
Propylene dichloride...	78-87-5	75	350	
Propylene imine.....	75-55-8	2	5	X
Propylene oxide.....	75-56-9	100	240	
Propyne; see Methyl acetylene.....				
Pyrethrum.....	8003-34-7	.....	5	
Pyridine.....	110-86-1	5	15	
Quinone.....	106-51-4	0.1	0.4	
RDX: see Cyclonite.....				
Rhodium (as Rh), metal fume and insoluble				

compounds.....	7440-16-6	.....	0.1	
Rhodium (as Rh),				
soluble compounds....	7440-16-6	.....	0.001	
Ronnel.....	299-84-3	.....	15	
Rotenone.....	83-79-4	.....	5	
Rouge.....				
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Selenium compounds				
(as Se).....	7782-49-2	.....	0.2	
Selenium hexafluoride				
(as Se).....	7783-79-1	0.05	0.4	
Silica, amorphous,				
precipitated and gel.	112926-00-8		(3)	
Silica, amorphous,				
diatomaceous earth,				
containing less than				
1% crystalline silica	61790-53-2		(3)	
Silica, crystalline				
cristobalite,				
respirable dust.....	14464-46-1		(3)	
Silica, crystalline				
quartz, respirable				
dust.....	14808-60-7		(3)	
Silica, crystalline				
tripoli (as quartz),				
respirable dust.....	1317-95-9		(3)	
Silica, crystalline				
tridymite,				
respirable dust.....	15468-32-3		(3)	
Silica, fused,				
respirable dust.....	60676-86-0		(3)	
Silicates (less than 1%				
crystalline silica)				
Mica (respirable				
dust).....	12001-26-2		(3)	
Soapstone, total dust	.....		(3)	
Soapstone, respirable				
dust.....	.....		(3)	
Talc (containing				
asbestos): use				
asbestos limit: see				
29 CFR 1910.1001.....			(3)	
Talc (containing no				
asbestos),				
respirable dust.....	14807-96-6		(3)	
Tremolite,				
asbestiform; see				
1910.1001.....				
Silicon.....	7440-21-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Silicon carbide.....	409-21-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Silver, metal and				
soluble compounds				

(as Ag).....	7440-22-4	.....	0.01	
Soapstone;				
see Silicates.....				
Sodium fluoroacetate...	62-74-8	.....	0.05	X
Sodium hydroxide.....	1310-73-2	.....	2	
Starch.....	9005-25-8			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Stibine.....	7803-52-3	0.1	0.5	
Stoddard solvent.....	8052-41-3	500	2900	
Strychnine.....	57-24-9	.....	0.15	
Styrene.....	100-42-5		(2)	
Sucrose.....	57-50-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Sulfur dioxide.....	7446-09-5	5	13	
Sulfur hexafluoride....	2551-62-4	1000	6000	
Sulfuric acid.....	7664-93-9	.....	1	
Sulfur monochloride....	10025-67-9	1	6	
Sulfur pentafluoride...	5714-22-7	0.025	0.25	
Sulfuryl fluoride.....	2699-79-8	5	20	
Systox; see Demeton...				
2,4,5-T (2,4,5-tri- chlorophenoxyacetic acid).....	93-76-5	.....	10	
Talc; see Silicates...				
Tantalum, metal and oxide dust.....	7440-25-7	.....	5	
TEDP (Sulfotep).....	3689-24-5	.....	0.2	X
Tellurium and compounds (as Te)....	13494-80-9	.....	0.1	
Tellurium hexafluoride (as Te).....	7783-80-4	0.02	0.2	
Temephos.....	3383-96-8			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
TEPP (Tetraethyl pyrophosphaate).....	107-49-3	.....	0.05	X
Terphenylis.....	26140-60-3	(C) 1	(C) 9	
1,1,1,2-Tetrachloro-2, 2-difluoroethane.....	76-11-9	500	4170	
1,1,2,2-Tetrachloro-1, 2-difluoroethane.....	76-12-0	500	4170	
1,1,2,2-Tetrachloro- ethane.....	79-34-5	5	35	X
Tetrachoroethylene; see Perchloroethylene				
Tetrachloromethane; see Carbon tetrachloride.				
Tetrachloronaphthalene.	1335-88-2	.....	2	X
Tetraethyl lead (as Pb)	78-00-2	.....	0.075	X
Tetrahydrofuran.....	109-99-9	200	590	
Tetramethyl lead, (as Pb).....	75-74-1	.....	0.075	X
Tetramethyl succinonitrile.....	3333-52-6	0.5	3	X
Tetranitromethane.....	509-14-8	1	8	

Tetryl (2,4,6-Trinitro-phenylmethyl-nitramine).....	479-45-8	.....	1.5	X
Thallium, soluble compounds (as Tl)....	7440-28-0	.....	0.1	X
4,4'-Thiobis(6-tert, Butyl-m-cresol).....	96-69-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Thiram.....	137-26-8	.....	5	
Tin, inorganic compounds (except oxides) (as Sn).....	7440-31-5	.....	2	
Tin, organic compounds (as Sn).....	7440-31-5	.....	0.1	
Titanium dioxide.....	13463-67-7			
Total dust.....		.....	15	
Toluene.....	108-88-3		(2)	
Toluene-2, 4-diisocyanate (TDI)..	584-84-9	(C) 0.02	(C) 0.14	
o-Toluidine.....	95-53-4	5	22	X
Toxaphene; see Chlorinated camphene.				
Tremolite; see Silicates.....				
Tributyl phosphate.....	126-73-8	.....	5	
1,1,1-Trichloroethane; see Methyl chloroform				
1,1,2-Trichloroethane..	79-00-5	10	45	X
Trichloroethylene.....	79-01-6		(2)	
Trichloromethane; see Chloroform				
Trichloronaphthalene...	1321-65-9	.....	5	X
1,2,3-Trichloropropane..	96-18-4	50	300	
1,1,2-Trichloro-1,2, 2-trifluoroethane....	76-13-1	1000	7600	
Triethylamine.....	121-44-8	25	100	
Trifluorobromomethane..	75-63-8	1000	6100	
2,4,6-Trinitrophenol; see Picric acid.....				
2,4,6-Trinitrophenyl-methyl nitramine; see Tetryl.....				
2,4,6-Trinitrotoluene (TNT).....	118-96-7	.....	1.5	X
Triorthocresyl phosphate.....	78-30-8	.....	0.1	
Triphenyl phosphate....	115-86-6	.....	3	
Turpentine.....	8006-64-2	100	560	
Uranium (as U).....	7440-61-1			
Soluble compounds....		.....	0.05	
Insoluble compounds..		.....	0.25	
Vanadium.....	1314-62-1			
Respirable dust (as V(2)O(5)).....		.....	(C) 0.5	
Fume (as V(2)O(5))...		.....	(C) 0.1	
Vegetable oil mist.....				

Total dust.....		.....	15	
Respirable fraction..		.....	5	
Vinyl benzene;				
see Styrene.....				
Vinyl chloride;				
see 1910.1017.....	75-01-4			
Vinyl cyanide;				
see Acrylonitrile				
Vinyl toluene.....	25013-15-4	100	480	
Warfarin.....	81-81-2	.....	0.1	
Xylenes				
(o-, m-, p-isomers)...	1330-20-7	100	435	
Xylidine.....	1300-73-8	5	25	X
Yttrium.....	7440-65-5	.....	1	
Zinc chloride fume.....	7646-85-7	.....	1	
Zinc oxide fume.....	1314-13-2	.....	5	
Zinc oxide.....	1314-13-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Zinc stearate.....	557-05-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Zirconium compounds				
(as Zr).....	7440-67-7	.....	5	

Footnote(1) The PELs are 8-hour TWAs unless otherwise noted; a (C) designation denotes a ceiling limit. They are to be determined from breathing-zone air samples.

Footnote(a) Parts of vapor or gas per million parts of contaminated air by volume at 25 degrees C and 760 torr.

Footnote(b) Milligrams of substance per cubic meter of air. When entry is in this column only, the value is exact; when listed with a ppm entry, it is approximate.

Footnote(c) The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than one metal compound measured as the metal, the CAS number for the metal is given - not CAS numbers for the individual compounds.

Footnote(d) The final benzene standard in 1910.1028 applies to all occupational exposures to benzene except in some circumstances the distribution and sale of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures; for the excepted subsegments, the benzene limits in Table Z-2 apply. See 1910.1028 for specific circumstances.

Footnote(e) This 8-hour TWA applies to respirable dust as measured by a vertical elutriator cotton dust sampler or equivalent instrument. The time-weighted average applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning and willowing) and garnetting. See also 1910.1043 for cotton dust limits applicable to other sectors.

Footnote(f) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.

Footnote(2) See Table Z-2.
Footnote(3) See Table Z-3
Footnote(4) Varies with compound.

[54 FR 36767, Sept. 5, 1989; 54 FR 41244, Oct. 6, 1989; 55 FR 3724, Feb. 5, 1990; 55 FR 12819, Apr 6, 1990; 55 FR 19259, May 9, 1990; 55 FR 46950, Nov. 8, 1990; 57 FR 29204, July 1, 1992; 57 FR 42388, Sept. 14, 1992; 58 FR 35340, June 30, 1993; 61 FR 56746, Nov. 4, 1996; 62 FR 42018, August 4, 1997]

APPENDIX H

OSHA 29 CFR 1910.1200, HAZARD COMMUNICATION REGULATION

1910.1200(a)

"Purpose."

1910.1200(a)(1)

The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

..1910.1200(a)(2)

1910.1200(a)(2)

This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or political subdivision of a state, pertaining to this subject. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures. Under section 18 of the Act, no state or political subdivision of a state may adopt or enforce, through any court or agency, any requirement relating to the issue addressed by this Federal standard, except pursuant to a Federally-approved state plan.

1910.1200(b)

"Scope and application."

1910.1200(b)(1)

This section requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this section requires distributors to transmit the required information to employers. (Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers. Appendix E of this section is a general guide for such employers to help them determine their compliance obligations under the rule.)

1910.1200(b)(2)

This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

1910.1200(b)(3)

This section applies to laboratories only as follows:

1910.1200(b)(3)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

..1910.1200(b)(3)(ii)

1910.1200(b)(3)(ii)

Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible during each workshift to laboratory employees when they are in their work areas;

1910.1200(b)(3)(iii)

Employers shall ensure that laboratory employees are provided information and training in accordance with paragraph (h) of this section, except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section; and,

1910.1200(b)(3)(iv)

Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule, and thus must ensure that any containers of hazardous chemicals leaving the laboratory are labeled in accordance with paragraph (f)(1) of this section, and that a material safety data sheet is provided to distributors and other employers in accordance with paragraphs (g)(6) and (g)(7) of this section.

1910.1200(b)(4)

In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

1910.1200(b)(4)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

..1910.1200(b)(4)(ii)

1910.1200(b)(4)(ii)

Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and,

1910.1200(b)(4)(iii)

Employers shall ensure that employees are provided with information and training in accordance with paragraph (h) of this section (except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

1910.1200(b)(5)

This section does not require labeling of the following chemicals:

1910.1200(b)(5)(i)

Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

1910.1200(b)(5)(ii)

Any chemical substance or mixture as such terms are defined in the Toxic Substances Control Act (15 U.S.C. 2601 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

..1910.1200(b)(5)(iii)

1910.1200(b)(5)(iii)

Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (e.g. flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or the Virus-Serum-Toxin Act of 1913 (21 U.S.C. 151 et seq.), and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or the Department of Agriculture;

1910.1200(b)(5)(iv)

Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms;

1910.1200(b)(5)(v)

Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and,

1910.1200(b)(5)(vi)

Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 et seq.) and the labeling regulations issued under that Act by the Department of Agriculture.

..1910.1200(b)(6)

1910.1200(b)(6)

This section does not apply to:

1910.1200(b)(6)(i)

Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that Act by the Environmental Protection Agency;

1910.1200(b)(6)(ii)

Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation and Liability ACT (CERCLA) (42 U.S.C. 9601 et seq.) when the hazardous substance is the focus of remedial or removal action being conducted under CERCLA in accordance with the Environmental Protection Agency regulations.

1910.1200(b)(6)(iii)

Tobacco or tobacco products;

1910.1200(b)(6)(iv)

Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);

1910.1200(b)(6)(v)

Articles (as that term is defined in paragraph (c) of this section);

1910.1200(b)(6)(vi)

Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;

..1910.1200(b)(6)(vii)

1910.1200(b)(6)(vii)

Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (e.g., tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (e.g., over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (e.g., first aid supplies);

1910.1200(b)(6)(viii)

Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

1910.1200(b)(6)(ix)

Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

1910.1200(b)(6)(x)

Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section;

1910.1200(b)(6)(xi)

Ionizing and non-ionizing radiation; and,

1910.1200(b)(6)(xii)

Biological hazards.

1910.1200(c)

"Definitions."

"Article" means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

"Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

"Chemical" means any element, chemical compound or mixture of elements and/or compounds.

"Chemical manufacturer" means an employer with a workplace where chemical(s) are produced for use or distribution.

"Chemical name" means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

"Combustible liquid" means any liquid having a flashpoint at or above 100 deg. F (37.8 deg. C), but below 200 deg. F (93.3 deg. C), except any mixture having components with flashpoints of 200 deg. F (93.3 deg. C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

"Commercial account" means an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

"Common name" means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

"Compressed gas" means:

- (i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 deg. F (21.1 deg. C); or
- (ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F (54.4 deg. C) regardless of the pressure at 70 deg. F (21.1 deg. C); or
- (iii) A liquid having a vapor pressure exceeding 40 psi at 100 deg. F (37.8 deg. C) as determined by ASTM D-323-72.

"Container" means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

"Designated representative" means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

"Director" means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

"Distributor" means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

"Employee" means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

"Employer" means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

"Explosive" means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

"Exposure or exposed" means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g. accidental or possible) exposure. "Subjected" in terms of health hazards includes any route of entry (e.g. inhalation, ingestion, skin contact or absorption.)

"Flammable" means a chemical that falls into one of the following categories:

- (i) "Aerosol, flammable" means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;
- (ii) "Gas, flammable" means: (A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;

(iii) "Liquid, flammable" means any liquid having a flashpoint below 100 deg. F (37.8 deg. C), except any mixture having components with flashpoints of 100 deg. F (37.8 deg. C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

"Flashpoint" means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg. F (37.8 deg. C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100 deg. F (37.8 deg. C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo auto accelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

"Foreseeable emergency" means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

"Hazardous chemical" means any chemical which is a physical hazard or a health hazard.

"Hazard warning" means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for "physical hazard" and "health hazard" to determine the hazards which must be covered.)

"Health hazard" means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

"Identity" means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

"Immediate use" means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

"Importer" means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

"Label" means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

"Material safety data sheet (MSDS)" means written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of this section.

"Mixture" means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

"Organic peroxide" means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

"Oxidizer" means a chemical other than a blasting agent or explosive as defined in 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

"Physical hazard" means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

"Produce" means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

"Pyrophoric" means a chemical that will ignite spontaneously in air at a temperature of 130 deg. F (54.4 deg. C) or below.

"Responsible party" means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

"Specific chemical identity" means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

"Trade secret" means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D sets out the criteria to be used in evaluating trade secrets.

"Unstable (reactive)" means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

"Use" means to package, handle, react, emit, extract, generate as a byproduct, or transfer.

"Water-reactive" means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

"Work area" means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

"Workplace" means an establishment, job site, or project, at one geographical location containing one or more work areas.

..1910.1200(d)

1910.1200(d)

"Hazard determination."

1910.1200(d)(1)

Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

1910.1200(d)(2)

Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

1910.1200(d)(3)

The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

1910.1200(d)(3)(i)

29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or,

..1910.1200(d)(3)(ii)

1910.1200(d)(3)(ii)

"Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment," American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition). The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of this standard.

1910.1200(d)(4)

Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

1910.1200(d)(4)(i)

National Toxicology Program (NTP), "Annual Report on Carcinogens" (latest edition);

1910.1200(d)(4)(ii)

International Agency for Research on Cancer (IARC) "Monographs" (latest editions); or

1910.1200(d)(4)(iii)

29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Note: The "Registry of Toxic Effects of Chemical Substances" published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

1910.1200(d)(5)

The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

1910.1200(d)(5)(i)

If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

..1910.1200(d)(5)(ii)

1910.1200(d)(5)(ii)

If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under paragraph (d)(4) of this section;

1910.1200(d)(5)(iii)

If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

1910.1200(d)(5)(iv)

If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

1910.1200(d)(6)

Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director. The written description may be incorporated into the written hazard communication program required under paragraph (e) of this section.

..1910.1200(e)

1910.1200(e)

"Written hazard communication program."

1910.1200(e)(1)

Employers shall develop, implement, and maintain at each workplace, a written hazard communication program which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

1910.1200(e)(1)(i)

A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,

1910.1200(e)(1)(ii)

The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

1910.1200(e)(2)

"Multi-employer workplaces." Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:

1910.1200(e)(2)(i)

The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;

..1910.1200(e)(2)(ii)

1910.1200(e)(2)(ii)

The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,

1910.1200(e)(2)(iii)

The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

1910.1200(e)(3)

The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this paragraph (e).

1910.1200(e)(4)

The employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1910.1020 (e).

1910.1200(e)(5)

Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the written hazard communication program may be kept at the primary workplace facility.

1910.1200(f)

"Labels and other forms of warning."

1910.1200(f)(1)

The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

..1910.1200(f)(1)(i)

1910.1200(f)(1)(i)

Identity of the hazardous chemical(s);

1910.1200(f)(1)(ii)

Appropriate hazard warnings; and

1910.1200(f)(1)(iii)

Name and address of the chemical manufacturer, importer, or other responsible party.

1910.1200(f)(2)

1910.1200(f)(2)(i)

For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

1910.1200(f)(2)(ii)

The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment; and,

1910.1200(f)(2)(iii)

This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).

..1910.1200(f)(3)

1910.1200(f)(3)

Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation.

1910.1200(f)(4)

If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

1910.1200(f)(5)

Except as provided in paragraphs (f)(6) and (f)(7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

1910.1200(f)(5)(i)

Identity of the hazardous chemical(s) contained therein; and,

1910.1200(f)(5)(ii)

Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

..1910.1200(f)(6)

1910.1200(f)(6)

The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

1910.1200(f)(7)

The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

1910.1200(f)(8)

The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

1910.1200(f)(9)

The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

1910.1200(f)(10)

The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

..1910.1200(f)(11)

1910.1200(f)(11)

Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.

1910.1200(g)

"Material safety data sheets."

1910.1200(g)(1)

Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use.

1910.1200(g)(2)

Each material safety data sheet shall be in English (although the employer may maintain copies in other languages as well), and shall contain at least the following information:

1910.1200(g)(2)(i)

The identity used on the label, and, except as provided for in paragraph (i) of this section on trade secrets:

1910.1200(g)(2)(i)(A)

If the hazardous chemical is a single substance, its chemical and common name(s);

1910.1200(g)(2)(i)(B)

If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,

1910.1200(g)(2)(i)(C)

If the hazardous chemical is a mixture which has not been tested as a whole:

..1910.1200(g)(2)(i)(C)(1)

1910.1200(g)(2)(i)(C)(1)

The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d) of this section shall be listed if the concentrations are 0.1% or greater; and,

1910.1200(g)(2)(i)(C)(2)

The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than 1% (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and,

1910.1200(g)(2)(i)(C)(3)

The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

1910.1200(g)(2)(ii)

Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

1910.1200(g)(2)(iii)

The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

1910.1200(g)(2)(iv)

The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

1910.1200(g)(2)(v)

The primary route(s) of entry;

..1910.1200(g)(2)(vi)

1910.1200(g)(2)(vi)

The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

1910.1200(g)(2)(vii)

Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA;

1910.1200(g)(2)(viii)

Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

1910.1200(g)(2)(ix)

Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

1910.1200(g)(2)(x)

Emergency and first aid procedures;

1910.1200(g)(2)(xi)

The date of preparation of the material safety data sheet or the last change to it; and,

..1910.1200(g)(2)(xii)

1910.1200(g)(2)(xii)

The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

1910.1200(g)(3)

If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

1910.1200(g)(4)

Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

1910.1200(g)(5)

The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

..1910.1200(g)(6)

1910.1200(g)(6)

1910.1200(g)(6)(i)

Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated;

1910.1200(g)(6)(ii)

The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;

1910.1200(g)(6)(iii)

If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible; and,

1910.1200(g)(6)(iv)

The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

1910.1200(g)(7)

1910.1200(g)(7)(i)

Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated;

1910.1200(g)(7)(ii)

The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment;

..1910.1200(g)(7)(iii)

1910.1200(g)(7)(iii)

Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available;

1910.1200(g)(7)(iv)

Wholesale distributors selling hazardous chemicals to employers over-the-counter may also provide material safety data sheets upon the request of the employer at the time of the over-the-counter purchase, and shall post a sign or otherwise inform such employers that a material safety data sheet is available;

1910.1200(g)(7)(v)

If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (i.e., the retail distributor does not have commercial accounts and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained;

1910.1200(g)(7)(vi)

Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request; and,

1910.1200(g)(7)(vii)

Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

..1910.1200(g)(8)

1910.1200(g)(8)

The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

1910.1200(g)(9)

Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

1910.1200(g)(10)

Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).

1910.1200(g)(11)

Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.1020(e). The Director shall also be given access to material safety data sheets in the same manner.

..1910.1200(h)

1910.1200(h)

"Employee information and training."

1910.1200(h)(1)

Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

1910.1200(h)(2)

"Information." Employees shall be informed of:

1910.1200(h)(2)(i)

The requirements of this section;

1910.1200(h)(2)(ii)

Any operations in their work area where hazardous chemicals are present; and,

1910.1200(h)(2)(iii)

The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

1910.1200(h)(3)

"Training." Employee training shall include at least:

1910.1200(h)(3)(i)

Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

1910.1200(h)(3)(ii)

The physical and health hazards of the chemicals in the work area;

..1910.1200(h)(3)(iii)

1910.1200(h)(3)(iii)

The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

1910.1200(h)(3)(iv)

The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

1910.1200(i)

"Trade secrets."

1910.1200(i)(1)

The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

1910.1200(i)(1)(i)

The claim that the information withheld is a trade secret can be supported;

1910.1200(i)(1)(ii)

Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

1910.1200(i)(1)(iii)

The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

1910.1200(i)(1)(iv)

The specific chemical identity is made available to health professionals, employees, and designated representatives in accordance with the applicable provisions of this paragraph.

..1910.1200(i)(2)

1910.1200(i)(2)

Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (i)(3) and (4) of this section, as soon as circumstances permit.

1910.1200(i)(3)

In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (i)(1) of this section, to a health professional (i.e. physician, industrial hygienist, toxicologist, epidemiologist, or occupational health nurse) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

1910.1200(i)(3)(i)

The request is in writing;

1910.1200(i)(3)(ii)

The request describes with reasonable detail one or more of the following occupational health needs for the information:

1910.1200(i)(3)(ii)(A)

To assess the hazards of the chemicals to which employees will be exposed;

1910.1200(i)(3)(ii)(B)

To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

1910.1200(i)(3)(ii)(C)

To conduct pre-assignment or periodic medical surveillance of exposed employees;

1910.1200(i)(3)(ii)(D)

To provide medical treatment to exposed employees;

..1910.1200(i)(3)(ii)(E)

1910.1200(i)(3)(ii)(E)

To select or assess appropriate personal protective equipment for exposed employees;

1910.1200(i)(3)(ii)(F)

To design or assess engineering controls or other protective measures for exposed employees; and,

1910.1200(i)(3)(ii)(G)

To conduct studies to determine the health effects of exposure.

1910.1200(i)(3)(iii)

The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representative, would not satisfy the purposes described in paragraph (i)(3)(ii) of this section:

1910.1200(i)(3)(iii)(A)

The properties and effects of the chemical;

1910.1200(i)(3)(iii)(B)

Measures for controlling workers' exposure to the chemical;

1910.1200(i)(3)(iii)(C)

Methods of monitoring and analyzing worker exposure to the chemical; and,

1910.1200(i)(3)(iii)(D)

Methods of diagnosing and treating harmful exposures to the chemical;

1910.1200(i)(3)(iv)

The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

..1910.1200(i)(3)(v)

1910.1200(i)(3)(v)

The health professional, and the employer or contractor of the services of the health professional (i.e. downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional, employee, or designated representative, will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (i)(6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

1910.1200(i)(4)

The confidentiality agreement authorized by paragraph (i)(3)(iv) of this section:

1910.1200(i)(4)(i)

May restrict the use of the information to the health purposes indicated in the written statement of need;

1910.1200(i)(4)(ii)

May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

1910.1200(i)(4)(iii)

May not include requirements for the posting of a penalty bond.

1910.1200(i)(5)

Nothing in this standard is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

1910.1200(i)(6)

If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

..1910.1200(i)(7)

1910.1200(i)(7)

If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

1910.1200(i)(7)(i)

Be provided to the health professional, employee, or designated representative, within thirty days of the request;

1910.1200(i)(7)(ii)

Be in writing;

1910.1200(i)(7)(iii)

Include evidence to support the claim that the specific chemical identity is a trade secret;

1910.1200(i)(7)(iv)

State the specific reasons why the request is being denied; and,

1910.1200(i)(7)(v)

Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

1910.1200(i)(8)

The health professional, employee, or designated representative whose request for information is denied under paragraph (i)(3) of this section may refer the request and the written denial of the request to OSHA for consideration.

1910.1200(i)(9)

When a health professional, employee, or designated representative refers the denial to OSHA under paragraph (i)(8) of this section, OSHA shall consider the evidence to determine if:

..1910.1200(i)(9)(i)

1910.1200(i)(9)(i)

The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

1910.1200(i)(9)(ii)

The health professional, employee, or designated representative has supported the claim that there is a medical or occupational health need for the information; and,

1910.1200(i)(9)(iii)

The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

1910.1200(i)(10)

1910.1200(i)(10)(i)

If OSHA determines that the specific chemical identity requested under paragraph (i)(3) of this section is not a "bona fide" trade secret, or that it is a trade secret, but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by OSHA.

..1910.1200(i)(10)(ii)

1910.1200(i)(10)(ii)

If a chemical manufacturer, importer, or employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

1910.1200(i)(11)

If a citation for a failure to release specific chemical identity information is contested by the chemical manufacturer, importer, or employer, the matter will be adjudicated before the Occupational Safety and Health Review Commission in accordance with the Act's enforcement scheme and the applicable Commission rules of procedure. In

accordance with the Commission rules, when a chemical manufacturer, importer, or employer continues to withhold the information during the contest, the Administrative Law Judge may review the citation and supporting documentation "in camera" or issue appropriate orders to protect the confidentiality of such matters.

1910.1200(i)(12)

Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

1910.1200(i)(13)

Nothing in this paragraph shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information which is a trade secret.

..1910.1200(j)

1910.1200(j)

"Effective dates." Chemical manufacturers, importers, distributors, and employers shall be in compliance with all provisions of this section by March 11, 1994.

Note: The effective date of the clarification that the exemption of wood and wood products from the Hazard Communication standard in paragraph (b)(6)(iv) only applies to wood and wood products including lumber which will not be processed, where the manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility, and that the exemption does not apply to wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut generating dust has been stayed from March 11, 1994 to August 11, 1994.

[59 FR 17479, April 13, 1994; 59 FR 65947, Dec. 22, 1994; 61 FR 5507, Feb. 13, 1996]