# San Bernardino Valley College
# CHEMICAL HYGIENE PLAN

## I. Purpose

This Chemical Hygiene Plan (CHP) sets forth policies, procedures, equipment, personal protective equipment and work practices that are capable of protecting employees and students from the health hazards presented by hazardous chemicals used in laboratories. This Plan is intended to meet the requirements of 8 CCR 5191, Occupational Exposure to Hazardous Chemicals in Laboratories, a copy of which is found in this plan.

## II. Scope

This CHP applies to our Biology, Microbiology, Anatomy and Physiology, and Chemistry laboratories where employees work with substances in which the containers used for reactions, transfers, and other handling of substances are easily and safely manipulated by one person. The objective of this program is to provide guidance to all laboratory personnel who use chemicals, so that they can perform their work safely.

Laboratory Employees -- Each individual working in a laboratory shall be informed about hazards associated with that laboratory and the specific work going on there. This includes all staff, students, instructors, faculty, and assistants.

Support Personnel – Warehouse, custodial, maintenance, and delivery personnel may be exposed to potential physical and chemical hazards from work carried out in the laboratory. They must be informed about the risks involved and trained how to avoid potential hazards.

## III. Responsibilities

- **Chemical Hygiene Officer:**

The Dean of Science, is the Chemical Hygiene Officer for the Chemical Hygiene Program throughout the college and will provide continued direction for the Chemical Hygiene Program.

The Chemical Hygiene Officer shall:

- Work with administrators and other faculty to develop and implement acceptable, appropriate chemical hygiene policies and practices
- Monitor procurement and use of chemicals in the lab; determining that laboratory facilities and training levels are adequate for chemicals in use
- Ensure regular, formal chemical hygiene and housekeeping inspections that include inspections of emergency equipment
- Maintain a current chemical inventory of Biology, Microbiology, Anatomy and Physiology, and Chemistry
- Review and improve the Chemical Hygiene Plan on, at a minimum, an annual basis

- Maintain overall responsibility for the safe operation of the Biology, Microbiology, Anatomy and Physiology, and Chemistry department laboratories
- Ensure that workers/students know and follow chemical hygiene rules
- Determine the proper level of personal protective equipment; ensure that such protective equipment is available and in working order
- Ensure that the appropriate training has been provided to employees
- Monitor lab waste disposal in conjunction with the Maintenance Coordinator
- Ensure appropriate records for inspections and training are maintained

**Faculty and Staff –**

**Instructors:** Directly responsible for chemical hygiene in the laboratory. All instructors are required to ensure that provisions of the CHP are being followed in the laboratory for the safety of the students and themselves.

**Laboratory Technicians:**

- Responsible for the daily maintenance and upkeep of the laboratory
- Prepare laboratory experiments for instruction.
- Responsible for ordering materials i.e. chemicals, PPE (Personal Protective Equipment), and instructional equipment.
- Ensure chemicals must be segregated by hazard classification and compatibility in a well-identified area, with good general exhaust ventilation.
- Maintain a current inventory of all chemicals in the laboratory and accompanying MSDSs.
- Conduct an annual examination and inventory of all chemicals.

**Students –** Responsible for conducting each operation in accordance with prescribed chemical hygiene procedures.

## IV. Standard Operating Procedures for Laboratory Chemicals

### A. Chemical Procurement

The decision to procure a chemical shall be made by the Biology, Microbiology, Anatomy and Physiology, and Chemistry instructors. Each instructor will ensure a commitment to safe handling and use of the chemical from initial receipt to ultimate disposal.

Each department shall aggressively and continually evaluate current inventory and properly dispose of unnecessary materials.

Requests for procurement of new chemicals shall be submitted to the Chemical Hygiene Officer for approval. The instructor shall follow the appropriate college procurement process.

The laboratory technician, prior to procurement of a chemical, shall identify information on proper handling, storage and disposal. If, upon investigation, the chemical is extremely hazardous (e.g., mutagenic, carcinogenic, teratogenic), extremely flammable and/or explosive, or difficult to dispose of, the laboratory technician will not procure the chemical. All new chemicals procured must be approved by the Chemical Hygiene Officer. Prior to delivery, the procuring department shall inform the District warehouse of the pending delivery and provide information on the proper handling, storage, and delivery of the chemical.

In addition, chemicals will be evaluated and procured only if the chemical can be appropriately used for current laboratory conditions, taking into account ventilation and storage requirements.

Upon receipt of hazardous chemicals, and prior to their transfer to storage locations or the requesting laboratory, the receiving department will check all containers for accuracy in labeling: chemical identity, hazard warnings, and the name and address of the chemical manufacturer, distributor or importer. All labels and other forms of warning must be legible, in English, and prominently displayed on the container. If the labeling is found to be inadequate, the proper identity and/or hazard label will permanently affixed to the container by the receiving department. All old labeling must be removed or permanently defaced if new labeling is affixed.

As part of the receiving procedure for hazardous chemicals, a receipt log shall be maintained by each department (reference Appendix D). This log will include the date of receipt, chemical identity, quantity and initials or receiver. These logs are subject to review by college administration, district EH&S, college management, and/or State and Federal officials. The ordering department is responsible for maintaining a MSDS for each hazardous chemical in its inventory and to distribute a copy to the CHO.

**B. Chemical Storage**

Receipt of chemicals shall be immediately coordinated between warehouse and the department where the chemicals are to be delivered. Following the delivery from the warehouse to the designated department, the chemicals shall be moved to the designated chemical storage area by one of the lab technicians. Large glass containers shall either remain in their original shipping container or be placed in carrying containers (e.g., rubber "boots") during transportation.

The storage area shall be well illuminated, with storage maintained at or below eye level. Flammables will be stowed in the designated flammable storage cabinets in lab prep area**s**.

Mineral acids shall be segregated from flammable and combustible materials. Separation is defined by 8 CCR Section 5164.

**§5164. Storage of Hazardous Substances.**

(a) Substances which, when mixed, react violently, or evolve toxic vapors or gases, or which in combination become hazardous by reason of toxicity, oxidizing power, flammability, explosibility, or other properties, shall be evaluated for compatibility before storing. Incompatible substances shall be separated from each other in storage by distance, or by partitions, dikes, berms, secondary containment or otherwise, so as to preclude accidental contact between them.

Note: Some typical examples of such incompatible substances are: Mineral acids and oxidizing agents; mineral acids and cyanides; oxidizing agents and combustible materials; acids and alkalis.

(b) Hazardous substances shall be stored in containers, such as those approved by the U.S. Department of Transportation (DOT), which are chemically inert to and appropriate for the type and quantity of the hazardous substance.

(c) Containers of hazardous substances shall not be stored in such locations or manner as to result in physical damage to, or deterioration of, the container. Containers shall not be stored where they are exposed to heat sufficient to rupture the containers or to cause leakage.

(d) Containers used to package a substance which gives off toxic, poisonous, corrosive, asphyxiate, suffocant, or anesthetic fumes, gases, or vapors in hazardous amounts (e.g., fuming sulfuric acid, hydrofluoric acid, nitrous oxide, chlorine, or other compressed or liquefied toxic gases) shall not be stored locations where it could be reasonably anticipated that employees would be exposed. This requirement shall not apply to small quantities of such materials kept in closed containers, or to tank cars or trucks.

Nitric acid will be stored in an acid cabinet by itself.

Acid resistant trays shall be placed under bottles of mineral acids.

Acid sensitive materials, such as cyanides and sulfides shall be separated from acids or protected from contact with acids and water.

Highly toxic chemicals or other chemicals whose containers have failed, leaking, or signs of crystallization shall be stored in unbreakable secondary containers. The second container shall be:

A. Closable;
B. Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and
C. Labeled according to Section IV.(G).

Storage areas shall be accessible during normal working hours. Storage areas are under the control of each laboratory technician and appropriate instructor for Biology, Microbiology, Anatomy and Physiology, and Chemistry. The amount of chemicals at the lab bench shall be as small as practical.

Stored chemicals shall be examined annually by the appropriate laboratory technician for container integrity and/or deterioration. The inspection shall determine whether any corrosion, deterioration, or damage has occurred to the storage facility as a result of leaking chemicals. When signage or labels become defaced, they must be relabeled or reposted in accordance with the SBVC Hazardous Communications Program.

Laboratory technicians shall conduct periodic inspections for chemicals outside their respective storage areas. Unneeded items shall be properly discarded or returned to the storage area.

## C. Chemical Handling

Each laboratory employee/student (with the training, education, and resources provided by supervision) shall develop work habits consistent with requirements of the San Bernardino Valley College CHP to minimize potential personal and coworker exposure to chemicals. Based on the realization that all chemicals inherently present hazards in certain conditions, exposure to all chemicals shall be minimized.

General precautions that shall be followed for the handling and use of all chemicals are:

1. Skin contact with chemicals shall be avoided at all times.
2. Employees and students shall wash all areas of exposed skin prior to leaving the laboratory. Hand soap is provided at each sink.
3. Mouth suction for pipetting or starting a siphon is prohibited.
4. Eating, drinking, smoking, chewing gum, or application of cosmetics in the laboratory is prohibited.
5. Open toed shoes are prohibited in the laboratory.
6. Storage of food or beverages is not allowed in storage areas or refrigerators used for laboratory operations.
7. Any chemical mixture shall be assumed to be as toxic as its most toxic component.
8. Substances of unknown toxicity shall be assumed to be toxic.
9. Laboratory employees/students shall be familiar with the symptoms of exposure for the chemicals that they work with and the precautions necessary to prevent exposure.
10. All laboratory employees/students shall adhere to the CHP.
11. In all cases of chemical exposure neither the Permissible Exposure Limits (PEL's) of OSHA or the Threshold Limit Values (TLV's) of the American

Conference of Governmental Industrial Hygienists (ACGIH) shall be exceeded through appropriate monitoring.

12. If monitoring is required, then a copy of the test reports/monitoring results will be kept in the office of the CHO and Administrative Services. Copies will be provided to the affected departments as necessary.
13. Engineering controls and safety equipment in the laboratory shall be utilized and inspected in accordance with guidelines established in the CHP.
14. The maintenance department shall maintain an inspection log that documents eyewash/shower function, fire extinguisher inspections, and laboratory ventilation systems.
15. Specific precautions based on the toxicological characteristics of individual chemicals shall be implemented as deemed necessary by the CHP.

## D. Laboratory Equipment and Glassware

Each employee/student shall keep the work area clean and uncluttered. All chemicals and equipment shall be properly labeled, in accordance with the Chemical Hygiene Plan and the Hazardous Communication Program.

At the completion of each workday or operation, the work area shall be thoroughly cleaned and all equipment cleaned and stowed.

In addition, the following procedures shall apply to the use of laboratory equipment:

1. All laboratory equipment shall be used only for its intended purpose.
2. All glassware will be handled and stored with care to minimize breakage; all broken glassware will be immediately disposed of in the broken glass container.
3. All evacuated glass apparatus shall be shielded to contain chemicals and glass fragments should implosion occur.
4. Labels shall be attached to all chemical containers, identifying the contents and related hazards.
5. Chemical/hazardous waste receptacles shall be labeled as such.
6. All laboratory equipment shall be inspected on a periodic basis and replaced or repaired as necessary. Students or staff that discovers broken or damaged equipment shall report it to the laboratory technician immediately.
7. Installation of unapproved/unclassified electrical/other equipment into the laboratory hoods that could introduce an ignition source is prohibited.

## E. Personal Protective Equipment

- Safety glasses meeting ANSI Z87.1 are required for employees and students to laboratories and will be worn at all times when chemicals are being used or manipulated in the laboratory.

- The wearing of contact lenses in the laboratory should be avoided unless necessary, however if they are utilized appropriate eye and face protection shall be donned for contact lens wearers.
- Chemical goggles and/or a full-face shield shall be worn during chemical transfer and handling operations as procedures dictate.
- Chemical resistant aprons shall be worn in the laboratory. Aprons shall be removed immediately upon discovery of significant contamination.
- Appropriate chemical-resistant gloves (based on information from the included glove selection guide in Appendix C) shall be worn at all times when there exists the potential for skin contact with chemicals.
- Used gloves shall be inspected and if damaged or contaminated, will be immediately replaced.
- Thermal resistant gloves shall be worn for operations involving the handling of heated materials and exothermic reaction vessels. Thermal resistant gloves shall be non-asbestos and shall be replaced when damaged or deteriorated.
- Respirator usage shall comply with OSHA Respiratory Protection Standard, 29 CFR 1910.134, Cal-OSHA 8 CCR 5144, and the San Bernardino Valley College's Respiratory Protection Program.
- Closed toe shoes shall be worn. Open toe shoes, sandals, and "flip flops" are prohibited.

**F. Personal Work Practices**

Instructors must ensure that each student knows and follows the rules and procedures established by this plan.

- All employees/students shall remain vigilant to unsafe practices and conditions in the laboratory and shall immediately report such practices and/or conditions to the laboratory supervisor. The instructional dean for Biology, Microbiology, Anatomy and Physiology, and Chemistry must PROMPTLY correct unsafe practices or conditions.
- Long hair or loose-fitting clothing shall be confined close to the body to avoid contact with chemicals or being caught in moving machine/equipment parts.
- Use only those chemicals appropriate for the ventilation system.
- Avoid unnecessary exposure to all chemicals by any route.
- Smelling or tasting of any chemicals is prohibited.

- Encourage safe work practices in coworkers by setting the proper example.
- Horseplay is strictly forbidden.
- Seek information and advice from knowledgeable persons regarding Standards and Codes about hazards present in the laboratory. Plan operations, equipment, and protective measures accordingly.
- Use engineering controls in accordance with Section V of the Chemical Hygiene Plan.
- Closed-toe shoes are required for employees and students to laboratories and will be worn at all times. Opened-toe shoes, sandals, and "flip flops" are prohibited..
- Inspect personal protective equipment prior to use, and wear appropriate protective equipment as procedures dictate and when necessary to avoid exposure.
- Employees and students shall wash all areas of exposed skin prior to leaving the laboratory.
- Good housekeeping practices shall apply to all laboratories at all times. Unneeded items shall be properly discarded or returned to their designated area.

## G. Labeling

All containers in the laboratory shall be labeled. This includes chemical containers and waste containers. The labels shall be informative and durable, and at a minimum, will identify contents, source, date of acquisition, and indication of hazard.

Portable containers shall be labeled by the individual using the container. Exemptions for labeling requirements shall be made for chemical transfers from a labeled container into a container that is intended only for the immediate use of the employee who performed the transfer.

The labeling program shall be periodically inspected by the appropriate laboratory technician to ensure that labels have not been defaced or removed. When labels become damaged or defaced, they must be replaced.

## V. CRITERIA FOR IMPLEMENTATION OF CONTROL MEASURES

**A. When to use fume hoods:**

Hoods shall be used WHENEVER POSSIBLE to contain and exhaust toxic, offensive, or flammable materials. Processes that have potential for generating hazardous airborne chemical concentrations shall be carried out within the fume hood.

**B. When to use safety shields or other containment devices:**

Safety shields must be used where the possibility exists for laboratory scale detonation. Protective devices, such as long and short-handled tongs for holding or manipulating hazardous items shall be used WHENEVER POSSIBLE.

**C. When to use personal protective equipment:**

Eye Protection - Safety goggles or laboratory splash glasses must be worn by all personnel in the laboratory whenever hazardous chemicals are in use. NO EXCEPTIONS.

Gloves - Gloves shall be worn to protect the skin from chemical and physical (e.g. heat, cold) exposures. Soiled or damaged gloves shall be decontaminated and disposed of properly.

Respirators - Respiratory protection may be necessary to maintain chemical exposure below OSHA's PEL. Respirators will be provided, if necessary.

**D. When to institute special work practices:**

The Chemical Hygiene Officer must approve special work practices. If particularly hazardous chemicals are to be used (e.g. carcinogens, reproductive toxins, teratogens, or acutely toxic chemicals), specific work practices and work locations must be designated. These requirements are identified in Section X (10) of this plan.

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## VI. FUME HOOD MANAGEMENT

A. **Frequency and type of monitoring -** all local exhaust hoods used for primary containment control will be monitored for adequate airflow on an annual schedule. The survey will be completed with a calibrated velometer.

B. **Acceptable operating range -** Minimum face velocities of at least 100 linear feet per minute (fpm) must be maintained for each hood. If the face velocity does not

meet a minimum of 100 linear fpm, maintenance personnel must be contacted to repair or upgrade the hood.

When handling carcinogens (i.e., Benzene, Formaldehyde, etc.), minimum face velocities of at least 150 linear fpm must be maintained. If the face velocity does not meet a minimum of 150 linear fpm, maintenance personnel must be contacted to repair or upgrade the hood.

C. An approved Environmental Firm will provide monitoring on an annual basis. Results will be documented and kept in the office of Administrative Services and Maintenance & Operations (M&O).

D. **Maintenance schedule –** The Maintenance and Operations department is responsible for the maintenance of local exhausts and fume hoods. The Maintenance and Operations department will complete the maintenance on an "as needed" basis, or annually, whichever comes first. If local exhausts or fume hoods fail, or show signs of failing, please contact the Maintenance and Operations department (909) 384-8985 for service.

## VII. EMPLOYEE INFORMATION AND TRAINING

### A. Information

1. A copy of 8 CCR 5191 can be found in Appendix A of this plan and on the web at http://www.dir.ca.gov/title8/5191.html.

2. The THRESHOLD LIMIT VALUES published by the American Conference of Governmental Industrial Hygienists are available for review from the Chemical Hygiene Officer. Recommended exposure limits for other hazardous chemicals, information on signs and symptoms associated with exposures to hazardous chemicals, material safety data sheets, and other information on the hazards, safe handling, storage and disposal of hazardous chemicals can be found in the NIOSH Pocket Guide for Chemical Hazards. This guide shall be provided to each of the applicable laboratory technicians for their use and reference.

3. A list of OSHA health hazard definitions and lists of select carcinogens, reproductive toxins, and high acute toxicity materials are included in the NIOSH Pocket Guide for Chemical Hazards.

### B. Training

1. Employees (including Adjunct professors) will be provided with training to ensure that they are apprised of the hazards of chemicals present in their work area. Such training will be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. Refresher training will be provided annually.
2. Students will receive safety training in conjunction with the course curriculum, as provided by the instructor. The Chemical Hygiene Officer shall provide an annual report to the SBVC Safety Committee to validate student participation in student safety orientation.
3. Employee training will include:

    - Provisions of 8 CCR Section 5191 (see Appendix A) including methods and observations that may be used to detect the presence or release of a hazardous chemical; the physical and health hazards of chemicals in the work area; and the measures employees can take to protect themselves from these hazards including the operation and use of the emergency eye wash and showers.
    - The applicable details of the Chemical Hygiene Plan.

4. Training will be documented by the Dean Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry and a copy forwarded to district Human Resources.

## VIII. REQUIRED APPROVALS

Certain laboratory procedures, which present serious health hazards upon exposure, require prior approval by the respective Dean of Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry before work may commence.

For San Bernardino Valley College, prior approval is required before proceeding with the following procedures:

- Working with Carcinogens/Teratogens/Mutagens

**BIOLOGY/MICROBIOLOGY/ANATOMY**
Formaldehyde (Formaldehyde use is regulated by the SBCCD Formaldehyde Program)
Chloroform
*Formaldehyde is a suspect carcinogen but is not used in an experiment.

**CHEMISTRY**
Benzene
Carbon Tetrachloride
Lead
Chromium
Nickel
*Some chemicals within this category are stored in the chemical storage room but are NOT currently used in any experiments.

## IX. MEDICAL CONSULTATION AND EXAMINATION

**A. An employee who works with hazardous chemicals and:**

- Develops symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory
- Works where exposure monitoring reveals an exposure level routinely above the OSHA action level or, in the absence of a designated action level, exposure above the OSHA Permissible Exposure Limit (PEL), for OSHA regulated substances for which there are medical monitoring and medical surveillance requirements. Chemicals that fall within this category are:
    - Asbestos
    - Vinyl Chloride
    - Inorganic Arsenic
    - Lead
    - Benzene
    - Coke Oven Emissions
    - Cotton Dust
    - 1,2-Dibromo-3-Chloropropane

- Acrylonitrile
- Ethylene Oxide
- Formaldehyde
- Carbon Tetrachloride
- 2-aminonapthalene
- Methylene Chloride

- Or is exposed to a hazardous chemical during a spill, leak, or explosion or other occurrence resulting in exposure is entitled to medical attention including an examination and follow-up exams as deemed necessary by the physician.

An examination is provided without cost to the employee, without loss of pay, and conducted at a reasonable time and place.

**B. Procedures to secure medical consultation and examination are as follows:**

1. Report exposure to CHO, Dean of Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry.
2. Seek medical care as outlined in the SBVC Injury and Illness Prevention Program (IIPP) (refer to the District's procedures for injured employees: http://www.sbccd.org/Include/Human%20Resources%20Forms/Workers%20Compensation/Workers%20Comp%20Complete%20Forms%20Package.pdf)
3. The employer will provide the following information to the physician.
   a) Material Safety Data Sheet (MSDS).
   b) Description of conditions under which exposure occurred.
   c) Description of signs and symptoms employee is experiencing.

4. A written opinion from the physician shall be provided to the employer including:
   a) Recommendation for further medical follow-up.
   b) Results of medical exam and tests; limited to exposure with personal information disclosed.
   c) Any medical condition revealed during the exam that places the employee at increased risk.
   d) A statement that the employee has been informed by the physician of the results of the exam and any medical condition that may require further treatment or examination.

## X. ADDITIONAL PROTECTION FOR WORK WITH PARTICULARLY HAZARDOUS SUBSTANCES

A. **Work with selected carcinogens, reproductive toxins and substances that** have a high degree of acute toxicity may require additional employee protection. Specific consideration will be given to:

- Establishment of a designated area
- Use of containment devices such as fume hoods or glove boxes
- Procedures for safe removal of contaminated waste
- And decontamination procedures.

**1. Anatomy and Physiology Department**

a. Specimen Storage Areas

HLS, 211, 225 & 230 is the storage area for preserved laboratory specimens that contain carcinogens, reproductive toxins and substances that have a high degree of acute toxicity.

b. Exposure Control

In accordance to Appendix C, disposable or lightweight nitrile, neoprene, natural rubber or PVC gloves provide protection from incidental contact and serves as a containment device. Heavier gloves shall be used when extended handling of contaminated or preserved materials or immersion is likely. A chemically resistant apron and over-sleeves shall be used when transferring or using large quantities and splash is likely.

Appropriately fitted respirators (reference the Respiratory Protection Plan) and local exhaust fans shall be used and serves as containment devices. If either device fails, or shows signs of failing, do not continue to work with formaldehyde. Notify the Maintenance and Operations at (909) 389-3384 to service the exhaust fans. Notify the Dean of Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry to obtain a properly working respirator.

**B. Procedures for Safe Removal of Contaminated Waste**

- Waste listed as a RCRA hazardous waste.
- Coordinate disposal of RCRA waste through the Maintenance and Operations (M&O) department.
- Read Material Safety Data Sheet (MSDS) prior to use.
- Keep in a tightly closed container.
- Separate from oxidizing agents.
- Keep away from heat and flame.

**1. Request for Waste Pick-up / Removal**

- RCRA Hazardous Waste:
  Waste pickup shall be coordinated between the department and Maintenance and Operations.

- All Other Hazardous Materials:
  Hazardous waste collection is performed quarterly by a certified collection and disposal service and coordinated by the Maintenance & Operations Coordinator. The generating department will be required to identify

materials designated for disposal and provide the following information to the custodial supervisor:

- Substance Location: Include the building name and room number. In addition, the location of the waste container shall also be noted in the event that M&O performs the waste pick-up when no lab personnel are present.
- Short Description
    - Chemical Name: Use full chemical names. Do not use formulas or abbreviations. Include all the constituents of each waste container.
    - Quantity: Include the number of containers of waste and their volumes.
- In the event that waste containers to be collected are intermingled with containers that you want to keep, it is helpful if you mark which containers that are being offered for disposal.
- Waste removers cannot accept unknown materials. All waste containers must be appropriately labeled as hazardous waste and their contents identified.

**C. All waste containers must have a tightly fitting cap that will not leak during transport. Be sure that you have the correct cap for your bottle. The bottles of the various chemical manufacturers all have differently threaded caps that are not interchangeable with one another, (i.e. Fisher bottle caps do not fit Aldrich bottles and vice versa). Improperly capped waste bottles** will leak **and will not be picked up. Decontamination Procedures**

Decontamination procedures should be established in writing, especially those involving chemical treatments, and consist of any necessary periodic (daily, weekly, etc.) procedures performed to control exposure of employees. Depending on the chemical material, this may consist only of wiping a counter with a wet paper towel, or periodic use of a neutralizing agent. To determine the proper decontamination procedures, one must consider the chemical (or type of chemical), the amount of chemical used, the specific use, the location of use, and other factors. Contact the Dean of Science if assistance is needed to determine the most appropriate decontamination procedures at (909) 384-8650.

## XI. EMERGENCY RESPONSE/CHEMICAL SPILLS

All science instructors shall be familiar with the District Emergency Preparedness Plan. This plan contains emergency telephone numbers and spill response contacts for the college.

**A. When chemical spills occur** within the Laboratory, the following procedures are followed to prevent injury or property loss:

1. Provide any first aid (if necessary) to affected personnel. Liberally use eyewash station and/or safety shower to flush affected areas. Flush continuously for AT LEAST 15 minutes. Any exposure merits medical care and a large exposure to the body merits ambulatory service.
2. Notify the Dean of Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry, or the "administrator in charge," of a spill. If a spill is larger than 1 liter or extremely hazardous, the Campus Police will be notified. Injured employees shall refer to the District's procedures for injured employees. Injured students shall be referred to the Student Health Services (909) 384-4495.
3. Evacuate students from the area.
4. If spilled materials exhibit flammability, eliminate ignition sources such as hot plates, Bunsen burners, etc.
5. Avoid all contact with spilled material. If necessary, use protective gloves, gown, goggles, and/or respirator.
6. Obtain supplies from Chemical Spill Clean-Up Kit (located in Chemistry Stockroom).
7. Neutralize acids and bases.
8. Contain collected materials and label container with name of contents and also as Hazardous Waste.
9. Always refer to MSDS for special precautions or spill cleanup requirements.

**B. Liquid Spills**

1. Confine spill to small area as practical.
2. For small quantities of acids or bases, use the neutralizing agent from the chemical spill clean-up kit. An absorbent material specially prepared for acid/base spills may also be used.
3. For small quantities of other materials, such as organic solvents, utilize an absorbent material to clean-up spill. Examples of absorbent materials are vermiculite, dry sand, paper towels, etc.
4. For large quantities of inorganic acids and bases, flush with large amounts of water, preferably towards a containment area. *CAUTION must be taken not to add too much water to create a flood that may react with water-reactive materials and cause spattering and additional personnel exposure.
5. If possible, utilize a mop to pick up as much of the spilled material. An excellent clean-up device is the mop bucket and wringer to collect the liquid.
6. Carefully pick up and decontaminate any bottles, broken glass, and/or other containers. Decontaminate over the bucket or pail to collect contaminated wash.
7. Avoid using any shop vacuum that is not rated for chemical clean up. A potential exists for atomizing hazardous wastes and creating a potential human inhalation exposure.
8. If the spill is extremely volatile (high vapor pressure), allow the spill to evaporate and exhaust out the laboratory exhaust (e.g., fume hood).
9. Properly containerize, label, store and/or dispose of collected hazardous waste. (See waste disposal section for methods).

**C. Solid Spills**

1. If possible, sweep solid spills of low toxicity into a designated, easily decontaminated, dust pan and place in a labeled container for storage and/or disposal.

**D. Additional Spills**

- Mercury – Do not attempt to contain or clean the spill. Evacuate the space, post the door "Hazardous Waste Spill, DO NOT ENTER," and contact the appropriate individual as prescribed in 11.A.2 above.

**E. Compressed Gas Cylinders**

Compressed gas cylinders are used in many workplaces to store gases that vary from flammable (acetylene) to inert (helium). Many of these cylinders store gases at high pressures that can turn a damaged cylinder into a torpedo, capable of going through multiple concrete block walls. Other cylinders store the contents as a liquid (acetylene) and have special orientation requirements. If handled properly, compressed gas cylinders are safe. Regardless of the properties of the gas, any gas under pressure that is improperly stored can result in a hazardous release of energy.

Any person who handles compressed gas cylinders should be informed of their potential health safety hazards and trained to handle them properly. For additional advice, and/or assistance in training, contact the Maintenance and Operations Office.

**F. Incident Report**

An incident investigation shall take place after each spill and/or accident. The Incident report (Attached Appendix E-Incident Report and located on the District Environmental Health and Safety Website/Forms: http://www.sbccd.org/District_Faculty_,-a-,_Staff_Information-Forms/Environmental_Health_and_Safety/Forms.aspx) shall be completed by the supervisor/instructor and forwarded to the Chemical Hygiene Officer.

## XII. REVIEW AND UPDATE

This Chemical Hygiene Plan will be reviewed and updated annually.

## XIII. SUGGESTED CHEMICAL STORAGE PATTERNS

Storage of laboratory chemicals presents an ongoing safety hazard for college science departments. Many chemicals are incompatible with each other. The common method of storing these products in alphabetical order sometimes results in incompatible shelved materials. For example, storing strong oxidizing materials next to organic chemicals can present a hazard.

A possible solution is to separate chemicals into their organic and inorganic families and then to further divide the materials into related and compatible families. Below is a list of compatible families.

**INORGANIC**

1. Metals, Hydrides
2. Acetates, Halides, Iodides, Sulfates, Sulfites, Halogens, Thiosulfates, Phosphates
3. Amides, Nitrates (except Ammonium Nitrate), Nitrites, Azides
4. Hydroxides, Oxides, Silicates, Carbonates, Carbon
5. Sulfides, Selenides, Phosphides, Carbides, Nitrides
6. Bromates, Perchlorates, Perchloric Acid, Chlorites, Hypo chlorites, Peroxides, Hydrogen Peroxide
7. Arsenates, Cyanides, Cyanates
8. Borates, Chromates, Manganates, Permanganates
9. Acids (except Nitric). Store acids in a designated cabinet. *Nitric Acid is isolated and stored by itself in an acid cabinet
10. Sulfur, Phosphorus, Arsenic, Phosphorus Pent oxide.

**ORGANIC**

1. Acids, Anhydrides, Peracids
2. Alcohols, Glycols, Amines, Amides, Imines, Imides
3. Hydrocarbons, Esters, Aldehydes
4. Esters, Ketones, Ketenes, Halogenated Hydrocarbons, Ethylene Oxide
5. Epoxy Compounds, Iso-cyanates
6. Peroxides, Hydro peroxides, Azides
7. Sulfides, Polysulfides, Sulfoxides, Nitriles
8. Phenols, Cresols

**ADDITIONAL STORAGE SUGGESTIONS**

1. Avoid floor chemical storage (even temporary).
2. No top shelf chemical storage.
3. No reactive/volatile liquid chemicals stored above shoulder level.
4. Shelf assemblies are firmly secured to walls. Avoid island shelf assemblies.
5. Provide anti-roll-off lips on all shelves.
6. Ideally shelving assemblies would be of wood construction.
7. Avoid metal, adjustable shelf supports and clips; fixed, wooden supports are preferred.
8. Store acids in dedicated acid cabinet(s). Store Nitric Acid in that same cabinet ONLY if isolated from other acids. Store both inorganic and some organic acids in the acid cabinet.
9. Store flammables in a dedicated and ventilated flammables cabinet.
10. Store severe poisons in a lockable, dedicated poisons cabinet.
11. Segregate known or suspect carcinogens from other chemicals.

**If you store volatile materials (ether, hydrocarbons, etc.) in a refrigerator, the refrigerator must be explosion-proof. The thermostat switch or light switch in a**

**standard refrigerator may spark and set off the volatile vapors in the refrigerator and cause an explosion.**

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## APPENDIX A.

**8 CCR 5191 OCCUPATIONAL EXPOSURE TO HAZARDOUS CHEMICALS IN LABORATORIES** http://www.dir.ca.gov/title8/5191.html

(a) Scope and application.

(1) This section shall apply to all employers engaged in the laboratory use of hazardous chemicals as defined below.

(2) Where this section applies, it shall supersede, for laboratories, the requirements of Title 8 of the California Code of Regulations Section 5190 and Article 110, Regulated Carcinogens of the General Industry Safety Orders, except as follows:

(A) The requirement to limit employee exposure to the specific exposure limit.

(B) When that particular regulation states otherwise, as in the case of Section 5209(c) (6).

(C) Prohibition or prevention of eye and skin contact where specified by any health regulation shall be observed.

(D) Where the action level (or in the absence of an action level, the exposure limit) is exceeded for a regulated substance with exposure monitoring and medical surveillance requirements.

(E) The "report of use" requirements of Article 110, (Section 5200 et. seq.) Regulated Carcinogens regulations.

(F) Section 5217 shall apply to anatomy, histology and pathology laboratories.

(3) This regulation shall not apply to:

(A) Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant regulations in Title 8, California Code of Regulations, even is such use occurs in a laboratory.

(B) Laboratory uses of hazardous chemicals which provide no potential for employee exposure. Examples of such conditions might include:

1. Procedures using chemically-impregnated test media such as Dip-and-Read tests where a reagent strip is dipped into the specimen to be tested and the results are interpreted by

comparing the color reaction to a color chart supplied by the manufacturer of the test strip; and

2. Commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

(b) Definitions

Action level. A concentration designated in Title 8, California Code of Regulations for a specific substance, calculated as an eight (8)-hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Carcinogen (see "select carcinogen").

Chemical Hygiene Officer. An employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

Chemical Hygiene Plan. A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that

(1) Are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular work place and

(2) Meets the requirements of subsection 5191(e).

Chief. The Chief of the Division of Occupational Safety and Health.

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

Compressed gas.

(1) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70° F (21.1° C); or

(2) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130° F (54.4° C) regardless of the pressure at 70° F (21.1° C); or

(3) A liquid having a vapor pressure exceeding 40 psi at 100° F (37.8° C) as determined by ASTM D-323-72.

Designated area. An area which may be used for work with "select carcinogens," reproductive toxins or substances which have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory or a device such as a laboratory hood.

Emergency. Any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.

Employee. An individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

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

Flammable. A chemical that falls into one of the following categories:

(1) "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;

(2) "Gas, flammable" means:

(A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or

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

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

(4) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 29 CFR 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. The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(1) 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° F (37.8° C), or that do not contain suspended solids, and do not have a tendency to form a surface film under test; or

(2) 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° F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(3) 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.

Hazardous chemical. 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, and neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Appendices A and B of the Hazard Communication Standard (Section 5194) provide further guidance in defining the scope of health hazards and determining whether or not a chemical is to be considered hazardous for purposes of this regulation.

Laboratory. A facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory scale. Work with substances in which the containers used for reactions, transfers, and other handlings of substances are designed to be easily and safety manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory-type hood. A device located in a laboratory, enclosed on five sides with a movable sash or fixed partial enclosure on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals. Handling or use of such chemicals in which all of the following conditions are met:

(1) Chemical manipulations are carried out on a "laboratory scale";

(2) Multiple chemical procedures or chemicals are used;

(3) The procedures involved are not part of a production process, nor in any way simulate a production process; and

(4) "Protective laboratory practices and equipment" are available and in common use industry-wide to minimize the potential for employee exposure to hazardous chemicals.

Medical consultation. A consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

Organic peroxide. 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. A chemical other than a blasting agent or explosive as defined in Section 5237(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. 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.

Protective laboratory practices and equipment. Those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive toxins. Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select carcinogen. Any substance which meets one of the following criteria:

(1) It is regulated by Cal/OSHA as a carcinogen; or

(2) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (1985 edition); or

(3) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (Volumes 1-48 and Supplements 1-8); or

(4) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m3;

(B) After repeated skin application of less than 300 mg/kg of body weight per week; or

(C) After oral dosages of less than 50 mg/kg of body weight per day.

Unstable (reactive). A chemical which is 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.

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

(c) Exposure limits. For laboratory uses of Cal/OSHA regulated substances, the employer shall ensure that laboratory employees' exposures to such substances do not exceed the exposure limits specified in Title 8, California Code of Regulations, Group 16, Section 5139 et seq., of the General Industry Safety Orders.

(d) Employee exposure determination

(1) Initial monitoring. The employer shall measure the employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance exceed the action level (or in the absence of an action level, the exposure limit). The person supervising, directing or evaluating the monitoring shall be competent in industrial hygiene practice.

(2) Periodic monitoring. If the initial monitoring prescribed by subsection 5191(d)(1) discloses employee exposure over the action level (or in the absence of an action level, the exposure limit), the employer shall immediately comply with the exposure monitoring provisions of the relevant regulation.

(3) Termination of monitoring. Monitoring may be terminated in accordance with the relevant regulation.

(4) Employee notification of monitoring results. The employer shall, within 15 working days after the receipt of any monitoring results, notify the employee of these results in writing either individually or by posting results in an appropriate location that is accessible to employees.

(e) Chemical hygiene plan.

(1) Where hazardous chemicals as defined by this regulation are used in the workplace, the employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

(A) Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and

(B) Capable of keeping exposures below the limits specified in subsection 5191(c).

(2) The Chemical Hygiene Plan shall be readily available to employees, employee representatives and, upon request, to the Chief.

(3) The Chemical Hygiene Plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection;

(A) Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals:

(B) Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous;

(C) A requirement that fume hoods comply with Section 5154.1, that all protective equipment shall function properly and that specific measures shall be taken to ensure proper and adequate performance of such equipment;

(D) Provisions for employee information and training as prescribed in subsection 5191(f);

(E) The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the employer or the employer's designee before implementation;

(F) Provisions for medical consultation and medical examinations in accordance with subsection 5191(g);

(G) Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene officer and, if appropriate, establishment of a Chemical Hygiene Committee; and

(H) Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate;

1. Establishment of a designated area;

2. Use of containment devices such as fume hoods or glove boxes;

3. Procedures for safe removal of contaminated waste; and

4. Decontamination procedures.

(4) The employer shall review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update it as necessary.

Note: Appendix A of this section is non-mandatory but provides guidance to assist employers in the development of the Chemical Hygiene Plan.

(f) Employee information and training.

(1) The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area. Information and training may relate to an entire class of hazardous substances to the extent appropriate.

(2) Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the employer.

(3) Information. Employees shall be informed of:

(A) The contents of this regulation and its appendices which shall be available to employees;

(B) The location and availability of the employer's Chemical Hygiene Plan;

(C) The exposure limits for Cal/OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable Cal/OSHA regulation;

(D) Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

(E) The location and availability of known reference material on the hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory including, but not limited to, Material Safety Data Sheets received from the chemical supplier.

(4) Training.

(A) Employee training shall include;

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

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

3. 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.

(B) The employee shall be trained on the applicable details of the employer's written Chemical Hygiene Plan.

(g) Medical consultation and medical examinations.

(1) The employer shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances;

(A) Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

(B) Where exposure monitoring reveals an exposure level above the action level (or in the absence of an action level, the exposure limit) for a Cal/OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

(C) Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

(2) All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

(3) Information provided to the physician. The employer shall provide the following information to the physician;

(A) The identity of the hazardous chemical(s) to which the employee may have been exposed;

(B) A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and

(C) A description of the signs and symptoms of exposure that the employee is experiencing, if any.

(4) Physician's written opinion.

(A) For examination or consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following;

1. Any recommendation for further medical follow-up;

2. The results of the medical examination and any associated tests, if requested by the employee;

3. Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace; and

4. A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.

(B) The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

(h) Hazard identification.

(1) With respect to labels and material safety data sheets;

(A) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

(B) Employers shall maintain in the workplace any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees during each work shift when they are in their work area(s).

(2) The following provisions shall apply to chemical substances developed in the laboratory;

(A) If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in subsection 5191(b). If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under subsection 5191(f).

(B) If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement subsection 5191(e).

(C) If the chemical substance is produced for commercial purposes by another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (Section 5194) including the requirements for preparation of material safety data sheets and labeling.

(i) Use of respirators.

Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of Section 5144.

(j) Recordkeeping.

(1) The employer shall establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by this regulation.

(2) The employer shall ensure that such records are kept, transferred, and made available in accordance with Section 3204.

(k) Dates

(1) Employers shall have developed and implemented a written Chemical Hygiene Plan no later than October 31, 1991.

(2) Subsection (a) (2) shall not take effect until the employer has developed and implemented a written Chemical Hygiene Plan.

(l) Appendices. The information contained in the appendices is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.

NOTE: Authority cited: Sections 142.3 and 9020, Labor Code. Reference: Sections 142.3, 9004(d), 9009 and 9020, Labor Code.

Appendix A
Appendix B

HISTORY

1. New section filed 3-25-91; operative 4-24-91 (Register 91, No. 17).

2. Editorial correction of printing errors (Register 92, No. 33).

3. Change without regulatory effect amending Appendix B subsections (b)1. and (c)1. filed 12-28-92 pursuant to section 100, title 1, California Code of Regulations (Register 93, No. 1).

4. Editorial correction of Appendix A subsection D.11.(b) (Register 95, No. 24).

## APPENDIX B. PEL's

Cal/OSHA Permissible Exposure Limits (PELs) can be found at:

http://www.dir.ca.gov/Title8/5155table_ac1.html.PERMISSIBLE EXPOSURE LIMITS FOR CHEMICAL CONTAMINANTS

| *Chemical Abstracts Registry Number* [a] | *Skin*[b] | *Name*[c] | *PEL* [d] | | | *STEL* [o] | |
|---|---|---|---|---|---|---|---|
| | | | *ppm*[e] | *mg/M*$^3$[f] | *Ceiling*[g] | *ppm*[e] | *mg/M*$^3$[f] |
| 75070 | | Acetaldehyde | 25 | 45 | C | | |
| 64197 | | Acetic acid | 10 | 25 | 40 ppm | 15 | 37 |
| 108247 | | Acetic Anhydride | 5 | 20 | C | | |
| 67641 | | Acetone | 500 | 1200 | 3000 ppm | 750 | 1780 |
| 75868 | | Acetone cyanohydrin as CN | 4.7 | 5 | C | | |
| 75058 | S | Acetonitrile | 40 | 70 | | 60 | 105 |
| 98862 | | Acetophenone | 10 | 49 | | | |
| 53963 | S | 2-Acetylaminofluorene; N-fluoren-2-yl acetamide; see Section 5209 | | | | | |
| 74862 | | Acetylene | (h) | | | | |
| 540590 | | Acetylene dichloride; see 1,2-Dichloroethylene | | | | | |
| 79276 | | Acetylene tetrabromide:1,1,2,2-tetrabromoethane | 1 | 14 | | | |
| 79345 | | Acetylene tetrachloride; see 1,1,2,2-Tetrachloroethane | | | | | |
| 50782 | | Acetylsalicylic acid (Aspirin) | | 5 | | | |
| 107028 | S | Acrolein | 0.1 | 0.25 | C | | |
| 79061 | S | Acrylamide | -- | 0.03 | | | |
| 79107 | S | Acrylic acid | 2 | 5.9 | | | |
| 107131 | S | Acrylonitrile; see Section 5213 | 2 | 4.5 | | | |
| 124049 | | Adipic acid | -- | 5 | | | |
| 111693 | S | Adiponitrile | 2 | 8.8 | | | |
| 309002 | S | Aldrin; 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-endo-1,2-exo-5,8-dimethanonaphthalene | -- | 0.25 | | | |
| 107186 | S | Allyl alcohol | 0.5 | 1.25 | | 4 | 10 |
| 107051 | | Allyl chloride | 1 | 3 | | 2 | 6 |
| 106923 | S | Allyl glycidyl ether; AGE | 5 | 22 | | 10 | 44 |
| 2179591 | | Allyl propyl disulfide | 2 | 12 | | 3 | 18 |
| 1344281 | | Alumina; see Particulates not otherwise regulated | | | | | |
| | | Aluminum, alkyls (not otherwise classified) | -- | 2 | | | |
| | | Aluminum soluble salts | -- | 2 | | | |
| | | Aluminum metal and oxide | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5[n] | | | |
| | | Aluminum pyro powders | -- | 5 | | | |
| | | Aluminum welding fumes | -- | 5 | | | |
| 300925 | | Aluminum distearate | -- | 10 | | | |
| 7047849 | | Aluminum stearate | -- | 10 | | | |
| 637127 | | Aluminum tristearate | -- | 10 | | | |
| 1300738 | | Aminodimethylbenzene; see Xylidene | | | | | |
| 92671 | S | 4-Aminodiphenyl; see Section 5209 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 141435 | | 2-Aminoethanol; see Ethanolamine | | | | | |
| 91598 | | 2-Aminonapthalene; see beta-Naphthylamine, Section 5209 | | | | | |
| 504290 | | 2-Aminopyridine | 0.5 | 2 | | | |
| 61825 | | Amitrole | -- | 0.2 | | | |
| 7664417 | | Ammonia | 25 | 18 | | 35 | 27 |
| 3825261 | S | Ammonium perfluorooctanoate | -- | 00.1 | | | |
| 12125029 | | Ammonium chloride fume | -- | 10 | | -- | 20 |
| 1002897 | | Ammonium stearate | -- | 10 | | | |
| 7773060 | | Ammonium sulfamate | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[(n)] | -- | 5 | | | |
| 620111 | | 3-Amyl acetate; See Pentyl acetate | | | | | |
| 628637 | | n-Amyl acetate; See Pentyl acetate | | | | | |
| 626380 | | sec-Amyl acetate (all isomers and mixtures); See Pentyl acetate | | | | | |
| 625161 | | tert-Amyl acetate; See Pentyl acetate | | | | | |
| 62533 | S | Aniline | 2 | 7.6 | | | |
| 29191524 | S | Anisidine (ortho and para isomers) | 0.1 | 0.5 | | | |
| | | Antimony and compounds, as Sb | -- | 0.5 | | | |
| 86884 | | ANTU; 1-(1-naphthyl)-2-thiourea; Bantu; Rattrack | -- | 0.3 | | | |
| 7440371 | | Argon | (h) | | | | |
| 7440382 | | Arsenic and inorganic arsenic compounds; see also Section 5214 | | 0.01 | | | |
| | | Arsenic, organic compounds, as As | -- | 0.2 | | | |
| 7784421 | | Arsine; $AsH_3$ | 0.05 | 0.2 | | | |
| 1332-21-4 | | Asbestos (including actinolite, amosite anthophyllite, chrysotile, crocidolite, and tremolite); see Section 5208 | | | | | |
| 8052424 | | Asphalt (petroleum) fumes | -- | 5 | | | |
| 1912249 | | Atrazine | -- | 5 | | | |
| 86500 | S | Azinphos methyl; o,o-dimethyl S-(4-oxo-1,2,3-benzotriazin-3(4H)-ylmethyl) phosphorodithioate | -- | 0.2 | | | |
| 3333526 | S | 2,2'-Azobisisobutyronitrile decomposition product, see Tetramethyl succinonitrile | | | | | |
| 7440393 | | Barium, soluble compounds, as Ba | -- | 0.5 | | | |
| 7727437 | | Barium sulfate; see Particulates not otherwise regulated | | | | | |
| 17804352 | | Benomyl | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[(n)] | -- | 5 | | | |
| 71432 | S | Benzene; see also Section 5218 | 1 | | | 5 | -- |
| 92875 | S | Benzidine; 4,4'-diaminobiphenyl, see Section 5209 | | | | | |
| 71432 | | Benzol; see Benzene | | | | | |
| 106514 | | D-Benzoquinone; see Quinone | | | | | |
| 98884 | | Benzoyl chloride | 0.2 | 1.1 | C | | |
| 94360 | | Benzoyl peroxide; dibenzoyl peroxide | -- | 5 | | | |
| 140114 | | Benzyl acetate | 10 | 61 | | | |
| 100447 | | benzyl chloride; alpha-chlorotoluene | 1 | 5 | | | |
| 7440417 | | Beryllium, and beryllium compounds as Be | -- | 0.0002 | 0.025mg/$M^3$ | -- | |
| 92524 | | Biphenyl; diphenyl; phenylbenzene | 0.2 | 1.5 | | | |
| 542881 | | Bis(chloromethyl) ether, see bis-Chloromethyl ether, Section 5209 | | | | | |
| 3033623 | S | Bis (Dimethylaminoethyl) ether (DMAEE) | 0.05 | 0.328 | | 0.15 | 0.983 |
| 1304821 | | Bismuth telluride | | | | | |
| | | Total dust | -- | 10 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Respirable fraction[n] | -- | 5 | | | |
| | | Bismuth telluride (selenium-doped) | -- | 5 | | | |
| | | Borates, tetra, sodium salts | | | | | |
| | | Anhydrous | -- | 5 | | | |
| | | Decahydrate | -- | 5 | | | |
| | | Pentahydrate | -- | 5 | | | |
| 1303862 | | Boron oxide | -- | 10 | | | |
| 10294334 | | Boron tribromide | 1 | 10 | C | | |
| 7637072 | | Boron trifluoride | 1 | 3 | C | | |
| 314409 | | Bromacil | 1 | 10 | | | |
| 7726956 | | Bromine | 0.1 | 0.7 | C | | |
| 7789302 | | Bromine pentafluoride | 0.1 | 0.7 | | | |
| 74975 | | Bromochloromethane; see Chlorobromethane | | | | | |
| 74964 | | Bromoethane; see Ethyl bromide | | | | | |
| 75252 | S | Bromoform; tribromomethane | 0.5 | 5 | | | |
| 74839 | | Bromomethane, see Methyl bromide | | | | | |
| 75638 | | Bromotrifluoromethane; see Trifluorobromomethane | | | | | |
| 106990 | | 1,3-Butadiene (see also section 5201) | 1 | 2.2 | | 5 | 11 |
| 106978 | | Butane | 800 | 1,900 | | | |
| 109795 | | 1-Butanethiol; see Butyl mercaptan | | | | | |
| 71363 | | 1-Butanol; see n-Butyl alcohol | | | | | |
| 78933 | | 2-Butanone; see Methyl ethyl ketone | | | | | |
| 111762 | S | 2-Butoxyethanol (EGBE) | 20 | 97 | | | |
| 123864 | | n-Butyl acetate | 150 | 710 | | 200 | 950 |
| 105464 | | sec-Butyl acetate | 200 | 950 | | | |
| 540885 | | tert-Butyl acetate | 200 | 950 | | | |
| 141322 | | Butyl acrylate | 2 | 11 | | | |
| 71363 | S | n-Butyl alcohol; 1-butanol | 50 | 150 | C | | |
| 78922 | | sec-Butyl alcohol | 100 | 305 | | | |
| 75650 | | tert-Butyl alcohol | 100 | 300 | | 150 | 450 |
| 109739 | S | Butylamine | 5 | 15 | C | | |
| 1189851 | S | tert-Butyl chromate; di-tert-butyl | | | | | |
| | | chromate, as $CrO_3$ | -- | 0.1 | C | | |
| | | as Cr | | 0.005 | | | |
| | | (see also Sections 1532.2, 5206 & 8359) | | | | | |
| 2426086 | | n-Butyl glycidyl ether; BGE; | 25 | 135 | | | |
| | | 1-butoxy-2,3-epoxypropane | | | | | |
| 138227 | | n-Butyl lactate | 5 | 25 | | | |
| 109795 | | n-Butyl mercaptan | 0.5 | 1.5 | | | |
| 89725 | S | o-sec-Butylphenol | 5 | 30 | | | |
| 98511 | | p-tert-Butyltoluene | 1 | 6.1 | | 20 | 120 |
| 7440439 | | Cadmium metal dust, as Cd | | | | | |
| | | (see also Sections 1532 & 5207) | -- | 0.005 | | | |
| | | Cadmium, soluble salts, as Cd | | | | | |
| | | (see also Sections 1532 & 5207) | -- | 0.005 | | | |
| 1306190 | | Cadmium oxide fume, as Cd | | | | | |
| | | (see also Sections 1532 & 5207 ) | -- | 0.005 | | | |
| 7778441 | | Calcium arsenate; see Arsenic,inorganic (see | | | | | |
| | | also Section 5214) | | | | | |
| 471341 | | Calcium carbonate; see Particulates not otherwise regulated | | -- | | | |
| 156627 | | Calcium cyanamide | -- | 0.5 | | | |
| 1305620 | | Calcium hydroxide | -- | 5 | | | |
| 1305788 | | Calcium oxide | -- | 2 | | | |
| | | Calcium silicate; see Particulates not otherwise regulated | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1344952 | | Calcium silicate (synthetic): see Particulates not otherwise regulated | | | | | |
| 1592230 | | Calcium stearate | -- | 10 | | | |
| 7778189 | | Calcium sulfate; see Particulates not otherwise regulated | | | | | |
| 76222 | | Camphor (synthetic) | -- | 2 | | | |
| 105602 | | Caprolactam dust | -- | 1 | | -- | 3 |
| 105602 | | Caprolactam vapor | 5 | 20 | | 10 | 40 |
| 2425061 | S | Captafol | -- | 0.1 | | | |
| 133062 | | Captan | -- | 5 | | | |
| 63252 | | Carbaryl; 1-naphthyl N-methylcarbamate | -- | 5 | | | |
| 1563662 | | Carbofuran | -- | 0.1 | | | |
| 1333864 | | Carbon black | -- | 3.5 | | | |
| 124389 | | Carbon dioxide | 5,000 | 9,000 | | 30,000 | 54,000 |
| 75150 | S | Carbon disulfide | 4 | 12 | 30 ppm | 12 | 36 |
| 630080 | | Carbon monoxide | 25 | 29 | 200 ppm | | |
| 558134 | | Carbon tetrabromide | 0.1 | 1.4 | | 0.3 | 4 |
| 56235 | S | Carbon tetrachloride | 2 | 12.6 | 200 ppm | 10 | 63 |
| 75445 | | Carbonyl chloride; see Phosgene | | | | | |
| 353504 | | Carbonyl fluoride | 2 | 5 | | 5 | 15 |
| 120809 | S | Catechol; pyrocatechol | 5 | 20 | | | |
| 9004346 | | Cellulose (paper fiber); see Particulates not otherwise regulated | | | | | |
| 21351791 | | Cesium hydroxide | | 2 | | | |
| 57749 | S | Chlordane; 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane | -- | 0.5 | | | |
| 8001352 | S | Chlorinated camphene; toxaphene | -- | 0.5 | | -- | 1 |
| | | Chlorinated diphenyl oxide | -- | 0.5 | | | |
| 7782505 | | Chlorine | 0.5 | 1.5 | | 1 | 3 |
| 10049044 | | Chlorine dioxide | 0.1 | 0.3 | | 0.3 | 0.9 |
| 7790912 | | Chlorine trifluoride | 0.1 | 0.4 | C | | |
| 107200 | | Chloroacetaldehyde | 1 | 3 | C | | |
| 78955 | S | Chloroacetone | 1 | 3.8 | C | | |
| 532274 | | alpha-Chloroacetophenone;phenacyl chloride | 0.05 | 0.3 | | | |
| 79049 | S | Chloroacetyl chloride | 0.05 | 0.2 | | 0.15 | 0.69 |
| 108907 | | Chlorobenzene; monochlorobenzene | 10 | 46 | | | |
| 2698411 | S | o-Chlorobenzylidene malononitrile; OCBM | 0.05 | 0.4 | C | | |
| 74975 | | Chlorobromomethane; bromochloromethane | 200 | 1,050 | | | |
| 126998 | S | 2-Chloro-1,3-butadiene; see Chloroprene | | | | | |
| 75456 | | Chlorodifluoromethane; Fluorocarbon 22 | 1,000 | 3,500 | | | |
| 53469219 | S | Chlorodiphenyl (42% chlorine) | -- | 1 | | | |
| 11097691 | S | Chlorodiphenyl (54% chlorine) | -- | 0.5 | | | |
| 106898 | | 1-Chloro-2,3-epoxypropane; see Epichlorohydrin | | | | | |
| 75003 | | Chloroethane; see Ethyl chloride | | | | | |
| 107073 | | 2-Chloroethanol; see Ethylene chlorohydrin | | | | | |
| 75014 | | Chloroethylene, see Vinyl chloride, Section 5210 | | | | | |
| 67663 | | Chloroform; trichloromethane | 2 | 9.78 | | | |
| 74873 | | Chloromethane, see Methyl chloride | | | | | |
| 107302 | | Chloromethyl methyl ether; see Methyl chloromethyl ether, Section 5209 | | | | | |
| 542881 | | bis-Chloromethyl ether, see also Section 5209 | 0.001 | 0.005 | | | |
| 100005 | | 1-Chloro-4-nitrobenzene; see p-Nitrochlorobenzene | | | | | |
| 600259 | | 1-Chloro-1-nitropropane | 2 | 10 | | | |
| 76153 | | Chloropentafluoroethane | 1,000 | 6,320 | | | |
| 76062 | | Chloropicrin; trichloronitromethane | 0.1 | 0.7 | | | |
| 126998 | S | Chloroprene; 2-chloro-1,3-butadiene | 10 | 36 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 598787 | S | 2-Chloropropionic acid | 0.1 | 0.44 | | | |
| 2039874 | | o-Chlorostyrene | 50 | 285 | | 75 | 428 |
| 95498 | S | o-Chlorotoluene | 50 | 250 | | | |
| 1929824 | | 2-Chloro-6-(trichloromethyl)pyridine; see Nitrapyrin | | | | | |
| 2921882 | S | Chlorpyrifos | -- | 0.2 | | | |
| | | Chromite ore processing (chromate), as Cr | -- | 0.005 | | | |
| | | (see also Sections 1532.2, 5206 & 8359) | | | | | |
| 7440473 | | Chromium metal | -- | 0.5 | | | |
| | | Chromium (II) compounds, as Cr | -- | 0.5 | | | |
| | | Chromium (III) compounds, as Cr | -- | 0.5 | | | |
| | | Chromium (VI) compounds, as Cr | -- | 0.005 | 0.1mg/M$^3$ | | |
| | | (see also Sections 1532.2, 5206 & 8359) | | | | | |
| 14977618 | | Chromyl chloride | 0.025 | 0.15 | | | |
| 2971906 | | Clopidol | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction | -- | 5 | | | |
| | | Coal (Bituminous) dust | | | | | |
| | | <5% quartz, respirable fraction[(n)] | -- | 2 | | | |
| | | >5% quartz, respirable fraction[(n)] | -- | 0.1 | | | |
| | | Coal tar pitch volatiles[(i)] | -- | 0.2 | | | |
| 7440484 | | Cobalt, metal fume and dust, as Co | -- | 0.020 | | | |
| | | Cobalt carbonyl, as Co | -- | 0.1 | | | |
| 16842038 | | Cobalt hydrocarbonyl, as Co | -- | 0.1 | | | |
| | | Coke oven emissions, see Section 5211 | | 0.15 | | | |
| 7440508 | | Copper metal fume, as Cu | -- | 0.1 | | | |
| | | Copper salts, dusts and mists, as Cu | -- | 1 | | | |
| | | Corundum, see Particulates not otherwise regulated | | | | | |
| | | Cotton dust, see also Section 5190 | -- | 1[(j)] | | | |
| 1319773 | S | Cresol (all isomers) | 5 | 22 | | | |
| 123739 | S | Crotonaldehyde; beta-methylacrolein | | | 0.3 | | |
| 4170303 | | | | | | | |
| 299865 | | Crufomate | -- | 5 | | | |
| 98828 | S | Cumene; isopropylbenzene | 50 | 245 | | | |
| 420042 | | Cyanamide | -- | 2 | | | |
| | S | Cyanide, as CN | -- | 5 | | | |
| 460195 | | Cyanogen | 10 | 20 | | | |
| 506774 | | Cyanogen chloride | 0.3 | 0.6 | C | | |
| 110827 | | Cyclohexane | 300 | 1,050 | | | |
| 108930 | S | Cyclohexanol | 50 | 200 | | | |
| 108941 | S | Cyclohexanone | 25 | 100 | | | |
| 110838 | | Cyclohexene | 300 | 1,015 | | | |
| 108918 | S | Cyclohexylamine | 10 | 40 | | | |
| 121824 | S | Cyclonite; RDX; cyclotrimethylenetrinitramine | -- | 1.5 | | | |
| 542927 | | Cyclopentadiene | 75 | 200 | | | |
| 287923 | | Cyclopentane | 600 | 1,720 | | | |
| 13121705 | | Cyhexatin; tricyclohexyltin hydroxide | | 5 | | | |
| 94757 | | 2,4-D;2,4-dichlorophenoxyacetic acid | -- | 10 | | | |
| 50293 | S | DDT; 1,1,1-trichloro-2,2-bis- | | | | | |
| | | (p-chlorophenyl)ethane | -- | 1 | | | |
| 62737 | | DDVP, see Dichlorvos | | | | | |
| 17702419 | S | Decaborane | 0.05 | 0.3 | | 0.15 | 0.9 |
| 8065483 | S | Demeton; a mixture of o,o-diethyl | | | | | |
| | | o-2(ethylthio)ethyl phosphorothloate and | | | | | |
| | | o,o'-diethyl S-2(ethylthio)ethyl phosphorothioate | 0.01 | 0.1 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 123422 | | Diacetone alcohol; 4-hydroxy-4-methyl-2-pentanone | 50 | 240 | | | |
| 107153 | | 1,2-Diaminoethane; see Ethylenediamine | | | | | |
| | | Diatomacous earth; see Silica-amorphous | | | | | |
| 333415 | S | Diazinon; o,o-diethyl o-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate | -- | 0.1 | | | |
| 334883 | | Diazomethane | 0.2 | 0.4 | | | |
| 94360 | | Dibenzoyl peroxide; see Benzoyl peroxide | | | | | |
| 19287457 | | Diborane | 0.1 | 0.1 | | | |
| 2528361 | S | Dibutyl phenyl phosphate | 0.3 | 3.5 | | | |
| 96128 | | 1,2-Dibromo-3-chloropropane; DBCP; see Section 5212 | .001 | .01 | | | |
| 75616 | | Dibromodifluoromethane; see Difluorodibromomethane | | | | | |
| 106934 | S | 1,2-Dibromomethane; see Ethylene dibromide, Section 5219 | | | | | |
| 102818 | S | 2-N-Dibutylaminoethanol | 2 | 14 | | | |
| 107664 | | Dibutyl phosphate | 1 | 5 | | 2 | 10 |
| 84742 | | Dibutyl phthalate | -- | 5 | | | |
| 7572294 | | Dichloroacetylene | 0.1 | 0.4 | C | | |
| 95501 | S | o-Dichlorobenzene | 25 | 150 | 50 ppm | | |
| 106467 | | p-Dichlorobenzene; 1,4-dichlorobenzene | 10 | 60 | 200 ppm | 110 | 675 |
| 91941 | S | 3,3'-Dichlorobenzidine; 4,4'-diamino-3,3'-dichlorobiphenyl; see Section 5209 | | | | | |
| 764410 | S | 1,4 -Dichloro-2-butene | 0.005 | 0.025 | | | |
| 75718 | | Dichlorodifluoromethane | 1000 | 4950 | 6200 ppm | | |
| 118525 | | 1,3-Dichloro-5,5-dimethyl hydantoin | -- | 0.2 | | -- | 0.4 |
| 75343 | | 1,1-Dichloroethane | 100 | 400 | | | |
| 107062 | | 1,2-Dichloroethane, see Ethylene dichloride | | | | | |
| 75354 | | 1,1-Dichloroethylene; see Vinylidene chloride | | | | | |
| 540590 | | 1,2-Dichloroethylene; acetylene dichloride | 200 | 790 | | | |
| 111444 | S | Dichloroethyl ether; bis(2-chloroethyl) ether | 5 | 30 | | 10 | 60 |
| 75434 | | Dichlorofluoromethane; Fluorocarbon 21 | 10 | 42 | | | |
| 75092 | | Dichloromethane; see Methylene chloride | | | | | |
| 594729 | | 1,1-Dichloro-1-nitroethane | 2 | 10 | | | |
| 78875 | | 1,2-Dichloropropane; see Propylene dichloride | | | | | |
| 542756 | S | Dichloropropene | 1 | 5 | | | |
| 75990 | | 2,2-Dichloropropionic acid | 1 | 6 | | | |
| 76142 | | 1,2-Dichlorotetrafluoroethane; Fluorocarbon 114 | 1,000 | 7,000 | | | |
| 62737 | S | Dichlorvos (DDVP); 2,2-dichlorovinyl dimethyl phosphate | 0.1 | 1 | | | |
| 141662 | S | Dicrotophos | -- | 0.25 | | | |
| 5124301 | | Dicyclohexylmethane-4,4'-diisocyanate; see Methylene bis-(4-cyclohexylisocyanate) | | | | | |
| 77736 | | Dicyclopentadiene | 5 | 30 | | | |
| 102545 | | Dicyclopentadienyl iron | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 60571 | S | Dieldrin; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-exo-5,8-dimethanonaphthalene | -- | 0.25 | | | |
| 111422 | S | Diethanolamine | 0.46 | 2 | | | |
| 109897 | S | Diethylamine | 5 | 15 | C | | |
| 112367 | S | Diethylene glycol diethyl ether, | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Ethyl diglyme | 5 | 33 | | |
| 111966 | S | Diethylene glycol dimethyl ether, Diglyme | 1 | 5.5 | 5 | 27 |
| 100378 | S | 2-(Diethylamino) ethanol | 2 | 9.6 | | |
| 123911 | | 1,4-Diethylene dioxide; see p-Dioxane | | | | |
| 111400 | S | Diethylenetriamine | 1 | 4 | | |
| 60297 | | Diethyl ether; see Ethyl ether | | | | |
| 298044 | | Di-(2-ethylhexyl) phthalate; see Di-sec-octyl phthalate | | | | |
| 96220 | | Diethyl ketone | 200 | 705 | 300 | 1057 |
| 84662 | | Diethyl phthalate | -- | 5 | | |
| 75616 | | Difluorodibromomethane; dibromodifluoromethane | 100 | 860 | | |
| 2238075 | | Diglycidyl ether; DGE; bis(2,3-epoxypropyl) ether | 0.1 | 0.5 | | |
| 123319 | | p-Dihydroxybenzene; see Hydroquinone | | | | |
| 108838 | | Diisobutyl ketone; 2,6-dimethyl-4-heptanone | 25 | 150 | | |
| 108189 | S | Diisopropylamine | 5 | 20 | | |
| 108203 | | Diisopropyl ether; see Isopryl ether | | | | |
| 109875 | | Dimethoxymethane; see Methylal | | | | |
| 127195 | S | Dimethylacetamide | 10 | 35 | | |
| 124403 | | Dimethylamine | 5 | 9.2 | 15 | 27.6 |
| 60117 | | 4-Dimethylaminoazobenzene, see Section 5209 | | | | |
| 1300738 | | Dimethylaminobenzene; see Xylidene | | | | |
| 121697 | S | N,N-Dimethylaniline; dimethylphenylamine | 5 | 25 | 10 | 50 |
| 1330207 | | Dimethylbenzene; see Xylene | | | | |
| 108849 | | 1,3-Dimethylbutyl acetate; see sec-Hexyl acetate | | | | |
| 300765 | | o,o-Dimethyl o-(1,2-dibromo-2,2-dichloroethyl) phosphate; see Naled | | | | |
| 14857342 | | Dimethylethoxysilane | 0.5 | 2.1 | 1.5 | 6.4 |
| 68122 | S | Dimethylformamide; DMF | 10 | 30 | | |
| 108838 | | 2,6-Dimethyl-4-heptanone; see Diisobutyl ketone | | | | |
| 57147 | S | 1,1-Dimethylhydrazine | 0.01 | 0.025 | | |
| 67641 | | Dimethyl ketone; see Acetone | | | | |
| 62759 | | N,N-Dimethylnitrosamine; see N-Nitrosodimethylamine, Section 5209 | | | | |
| 131113 | | Dimethyl phthalate | -- | 5 | | |
| 77781 | S | Dimethyl sulfate; methyl sulfate | 0.1 | 0.5 | | |
| 148016 | | Dinitolmide; 3,5-Dinitro-o-toluamide | -- | 5 | | |
| 528290, 99650, 100254 | S | Dinitrobenzene (all (isomers) ortho, meta and para isomers | 0.15 | 1 | | |
| 534521 | S | 4,6-Dinitro-o-cresol; 2-methyl-4,6-dinitrophenol | -- | 0.2 | | |
| 25321146 | S | 2,4-Dinitrotoluene | -- | 0.15 | | |
| 123911 | S | p-Dioxane, tech. grade; 1,4-dioxacyclohexane; 1,4-diethylene dioxide | 25 | 90 | | |
| 78342 | S | Dioxathion | -- | 0.2 | | |
| 92524 | | Diphenyl; see Biphenyl | | | | |
| 122394 | | Diphenylamine; N-phenylaniline | -- | 10 | | |
| 101688 | | Diphenylmethane diisocyanate; see Methylene bis(phenylisocyanate) | | | | |
| 123193 | | Dipropyl ketone | 50 | 235 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 34590948 | S | Dipropylene glycol methyl ether | 100 | 600 | | 150 | 900 |
| 85007 | | Diquat; 1,1'-ethylene-2,2'- | | | | | |
| | | dipyridinium dibromide | -- | | | | |
| | | Total dust | -- | 0.5 | | | |
| | | Respirable fraction[n] | | | | | |
| 117817 | | Di-sec-octyl phthalate; bis(2 ethylhexyl) phthalate | -- | 5 | | -- | |
| 97778 | | Disulfiram | -- | 2 | | | |
| 298044 | S | Disulfoton; o,o-diethyl | | | | | |
| | | S-2-(ethylthio)ethyl phosphorodithioate | -- | 0.1 | | | |
| 128370 | | 2,6-Di-tert-butyl-p-cresol | -- | 10 | | | |
| 330541 | | Diuron | -- | 10 | | | |
| 68122 | | DMF; see Dimethylformamide | | | | | |
| 57147 | | DMH; see 1,1-Dimethylhydrazine | | | | | |
| 1321740 | | Divinyl benzene | 10 | 50 | | | |
| | | Dust, nuisance dust and particulates, | | | | | |
| | | see Particulates not otherwise regulated | | | | | |
| 12415348 | | Emery; see Particulates not otherwise regulated | | | | | |
| 115297 | S | Endosulfan; 6,7,8,9,10,10-hexachloro- | | | | | |
| | | 1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4, | | | | | |
| | | 3-benzodioxathiepin-3-oxide | -- | 0.1 | | | |
| 72208 | S | Endrin; 1,2,3,4,10,10-hexachloro-6,7-epoxy- | | | | | |
| | | 1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-endo-5, | | | | | |
| | | 8-dimethanonaphthalene | -- | 0.1 | | | |
| 13838169 | | Enflurane | 2 | 15 | | | |
| 106898 | S | Epichlorohydrin; 1-chloro-2, | | | | | |
| | | 3-epoxypropane | 0.05 | 0.19 | | | |
| 2104645 | S | EPN; o-ethyl o-(p-nitrophenyl) | | | | | |
| | | phenylphosphonothioate | -- | 0.1 | | | |
| 75569 | | 1,2-Epoxypropane; see Propylene oxide | | | | | |
| 556525 | | 2,3-Epoxypropanol; see Glycidol | | | | | |
| 74840 | | Ethane | (h) | -- | | | |
| 75081 | | Ethanethiol; see Ethyl mercaptan | | | | | |
| 64175 | | Ethanol; see Ethyl alcohol | | | | | |
| 141435 | | Ethanolamine; 2-aminoethanol | 3 | 8 | | 6 | 15 |
| 563122 | S | Ethion | -- | 0.4 | | | |
| 110805 | S | 2-Ethoxyethanol | 5 | 18 | | | |
| 111159 | S | 2-Ethoxyethyl acetate | 5 | 27 | | | |
| 141786 | | Ethyl acetate | 400 | 1,400 | | | |
| 140885 | S | Ethyl acrylate | 5 | 20 | | 25 | 100 |
| 64175 | | Ethyl alcohol; ethanol | 1,000 | 1,900 | | | |
| 75047 | S | Ethylamine | 5 | 9.2 | C | | |
| 541855 | | Ethyl sec-amyl ketone; 5-methyl-3-heptanone | 25 | 130 | | | |
| 100414 | | Ethylbenzene | 100 | 435 | | 125 | 545 |
| 74964 | S | Ethyl bromide | 5 | 22 | | | |
| 106354 | | Ethyl butyl ketone; 3-heptanone | 50 | 230 | | 75 | 345 |
| 75003 | S | Ethyl chloride; chloroethane | 100 | 264 | | | |
| 7085850 | | Ethyl cyanoacrylate | 0.2 | 1.02 | | | |
| 673923 | | Ethyl tert-butyl ether | 5 | 21 | | | |
| 74851 | | Ethylene | (h) | -- | | | |
| 107073 | S | Ethylene chlorohydrin; 2-chloroethanol | 1 | 3 | C | | |
| 107153 | | Ethylenediamine; 1,2-diaminoethane | 10 | 25 | | | |
| 106934 | S | Ethylene dibromide; 1,2-dibromoethane, | | | | | |
| | | see Section 5219 | 0.13 | 1 | C | | |
| 107062 | | Ethylene dichloride; 1,2-dichloroethane | 1 | 4 | 200 ppm | 2 | 8 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 107211 | | Ethylene glycol (vapor) | 40 | 100 | C | | |
| 629141 | S | Ethylene glycol diethyl ether, 1,2-diethoxyethane | 5 | 24 | | | |
| 110714 | S | Ethylene glycol dimethyl ether, 1,2-dimethoxyethane, Glyme | 1 | 3.7 | | 5 | 18 |
| 628966 | S | Ethylene glycol dinitrate | | (k) | | -- | 0.1 |
| 110805 | S | Ethylene glycol monoethyl ether, see 2-Ethoxyethanol | | | | | |
| 109864 | S | Ethylene glycol monomethyl ether, see 2-Methoxyethanol | | | | | |
| 110496 | S | Ethylene glycol monomethyl ether acetate; see 2-Methoxyethyl acetate | | | | | |
| 151564 | S | Ethyleneimine; see also Section 5209 | 0.5 | 1 | | | |
| 75218 | | Ethylene oxide; see Section 5220 | 1 | 2 | | 5 | |
| 60297 | | Ethyl ether | 400 | 1,200 | | 500 | 1500 |
| 109944 | | Ethyl formate | 100 | 300 | | | |
| 75343 | | Ethylidene chloride; see 1,1-Dichloroethane | | | | | |
| 16219753 | | Ethylidene norbornene | 5 | 25 | C | | |
| 75081 | | Ethyl mercaptan; ethanethiol | 0.5 | 1 | | | |
| 78933 | | Ethyl methyl ketone; see Methyl ethyl ketone | | | | | |
| 100743 | S | N-Ethylmorpholine; 4-ethyl-1, 4-tetrahydrooxazine | 5 | 23 | | | |
| 78104 | | Ethyl silicate; tetraethyl silicate | 10 | 85 | | | |
| 22224926 | S | Fenamiphos | | 0.1 | | | |
| 115902 | | Fensulfothion | -- | 0.1 | | | |
| 55389 | S | Fenthion | -- | 0.2 | | | |
| 14484641 | | Ferbam; ferric N,N-dimethylthiocarbamate | -- | 10 | | | |
| 12604589 | | Ferrovanadium dust | -- | 1 | | -- | 3 |
| 14808607 | | Fibrous glass, see Glass | | | | | |
| | | Flour dust | | 0.5[(s)] | | | |
| | | Fluorides, as F | -- | 2.5 | | | |
| 7782414 | | Fluorine | 0.1 | 0.2 | | | |
| 75694 | | Fluorocarbon 11; see Trichlorofluoromethane | | | | | |
| 75718 | | Fluorocarbon 12; see Dichlorodifluoromethane | | | | | |
| 75434 | | Fluorocarbon 21; see Dichlorofluoromethane | | | | | |
| 75456 | | Fluorocarbon 22; see Chlorodifluoromethane | | | | | |
| 76120 | | Fluorocarbon 112; see 1,1,2,2-Tetrachloro-1,2-difluoroethane | | | | | |
| 76131 | | Fluorocarbon 113; see 1,1,2-Trichloro-1,2,2-trifluoroethane | | | | | |
| | | Fluorocarbon 114; see 1,2-Dichlorotetrafluoroethane | | | | | |
| 75694 | | Fluorotrichloromethane; see Trichlorofluoromethane | | | | | |
| 944229 | S | Fonofos | -- | 0.1 | | | |
| 50000 | | Formaldehyde, see Section 5217 | 0.75 | -- | | 2 | -- |
| 75127 | S | Formamide | 10 | 18 | | | |
| 64186 | | Formic acid | 5 | 9 | | 10 | 19 |
| 98011 | S | Furfural | 2 | 8 | | | |
| 98000 | S | Furfuryl alcohol | 10 | 40 | | 15 | 60 |
| 8006619 | | Gasoline | 300 | 900 | | 500 | 1500 |
| 7782652 | | Germanium tetrahydride | 0.2 | 0.6 | | | |
| | | Glass, fibrous | 1.0 f/cc[(q)] | | | | |
| 111308 | | Glutaraldehyde [(t)] | 0.05 | 0.2 | C | | |
| 56815 | | Glycerin mist; see Particulates not otherwise regulated | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 123944 | | Glyceryl stearate | -- | 10 | | | |
| 556525 | | Glycidol; 2,3-epoxy-1-propanol | 2 | 6.1 | | | |
| 111762 | | Glycol monobutyl ether; see 2-Butoxyethanol | | | | | |
| 110805 | | Glycol monoethyl ether; see 2-Ethoxyethanol | | | | | |
| 109864 | | Glycol monoethyl ether; see 2-Methoxyethanol | | | | | |
| | | Grain dust (oat, wheat, barley) | -- | 10 | | | |
| 7782425 | | Graphite, natural respirable dust | | 2.5 | | | |
| | | Graphite, synthetic | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[(n)] | -- | 5 | | | |
| 13397245 | | Gypsum; Calcium sulfate dihydrate; see | | | | | |
| | | Particulates not otherwise regulated | | | | | |
| 7440586 | | Hafnium | -- | 0.5 | | | |
| 151677 | | Halothane | 2 | 16 | | | |
| 822060 | | HDI; see Hexamethylene diisocyanate | | | | | |
| 7440597 | | Helium | (h) | -- | | | |
| 76448 | S | Heptachlor; 1,4,5,6,7,8,8-hepta-chloro- | | | | | |
| | | 3a,4,7,7a-tetrahydro-4,7-methanoindene | -- | 0.05 | | | |
| 142825 | | n-Heptane | 400 | 1,600 | | 500 | 2000 |
| 118741 | S | Hexachlorobenzene | -- | 0.002 | | | |
| 87683 | S | Hexachlorobutadiene | 0.02 | 0.24 | | | |
| 77474 | | Hexachlorocyclopentadiene | 0.01 | 0.11 | | | |
| 67721 | S | Hexachloroethane; perchloroethane | 1 | 10 | | | |
| 1335871 | S | Hexachloronaphthalene | -- | 0.2 | | | |
| 684162 | S | Hexafluoroacetone; 1,1,1,3,3,3-hexafluoro- | | | | | |
| | | 2-propanone | 0.1 | 0.7 | | | |
| 822060 | | Hexamethylene diisocyanate; HDI | 0.005 | 0.034 | | | |
| 110543 | S | n-Hexane | 50 | 180 | | | |
| | | Hexane, other isomers | 500 | 1800 | | 1000 | 3600 |
| 124094 | | 1,6-Hexanediamine | 0.5 | 2.3 | | | |
| 591786 | | 2-Hexanone; see Methyl butyl ketone | | | | | |
| 592416 | | 1-Hexene | 50 | 180 | | | |
| 108101 | | Hexone; see Methyl isobutyl ketone | | | | | |
| 108849 | | sec-Hexyl acetate; 4-methyl-2-pentyl acetate; | | | | | |
| | | 1,3-dimethyl-butyl acetate | 50 | 300 | | | |
| 107415 | | Hexylene glycol | 25 | 125 | C | | |
| 302012 | S | Hydrazine | 0.01 | 0.013 | | | |
| 10035106 | | Hydrobromic acid; see Hydrogen bromide | | | | | |
| 7647010 | | Hydrochloric acid; see Hydrogen chloride | | | | | |
| 74908 | | Hydrocyanic acid; see Hydrogen cyanide | | | | | |
| 7664393 | | Hydrofluoric acid; see Hydrogen fluoride | | | | | |
| 1333740 | | Hydrogen | (h) | -- | | | |
| 61788327 | | Hydrogenated terphenyls | 0.5 | 5 | | | |
| 10035106 | | Hydrogen bromide | 3 | 10 | C | | |
| 7647010 | | Hydrogen chloride; muriatic acid | 5 | 7 | C | | |
| 74908 | S | Hydrogen cyanide | 4.7 | 5 | C | | |
| 7664393 | | Hydrogen fluoride, as F | 3 | 2.5 | | 6 | -- |
| 7722841 | | Hydrogen peroxide, as $H_2O_2$ | 1 | 1.4 | | | |
| 7783075 | | Hydrogen selenide, as Se | 0.05 | 0.2 | | | |
| 7783064 | | Hydrogen sulfide | 10 | 14 | 50 ppm | 15 | 21 |
| 123319 | | Hydroquinone; 1,4-benezendiol | -- | 2 | | | |
| 999611 | S | 2-Hydroxypropyl acrylate | 0.5 | 3 | | | |
| 95136 | | Indene | 10 | 48 | | | |
| 7440746 | | Indium | -- | 0.1 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Indium compounds | -- | 0.1 | | | |
| 7553562 | | Iodine | 0.1 | 1 | C | | |
| 75478 | | Iodoform | 0.6 | 10 | | | |
| 4098719 | | IPDI; see Isophorone diisocyanate | | | | | |
| 1309371 | | Iron oxide fume | -- | 5 | | | |
| 13463406 | | Iron pentacarbonyl, as Fe | 0.1 | 0.8 | | 0.2 | 1.6 |
| | | Iron salts, soluble, as Fe | -- | 1 | | | |
| 123922 | | Isoamyl acetate; 3-methylbutyl acetate; see Pentyl acetate | | | | | |
| 123513 | | Isoamyl alcohol; 3-methylbutanol | 100 | 360 | | 125 | 450 |
| 110190 | | Isobutyl acetate; 2-methylpropyl acetate | 150 | 700 | | | |
| 78831 | | Isobutyl alcohol; 2-methylpropanol | 50 | 150 | | | |
| 26675467 | | Isoflurane | 2 | 15 | | | |
| 26952216 | S | Isooctyl alcohol | 50 | 270 | | | |
| 78591 | | Isophorone; 3,5,5-trimethyl-2-cyclohexene-1-one | 4 | 23 | | | |
| 4098719 | S | Isophorone diisocyanate; IPDI | 0.005 | 0.045 | | 0.02 | -- |
| 109591 | | Isopropoxyethanol | 25 | 105 | | | |
| 108214 | | Isopropyl acetate | 250 | 950 | | 310 | 1185 |
| 67630 | | Isopropyl alcohol | 400 | 980 | | 500 | 1225 |
| 75310 | | Isopropylamine | 5 | 12 | | 10 | 24 |
| 768525 | S | N-isopropylaniline | 2 | 10 | | | |
| 108203 | | Isopropyl ether; diisopropyl ether | 250 | 1,050 | | | |
| 4016142 | | Isopropyl glycidyl ether; IGE; 1,2-epoxy-3-isopropoxypropane | 50 | 240 | | 75 | 360 |
| 1332587 | | Kaolin; (respirable dust containing no asbestos and <1% crystaline silica) | -- | 2 | | | |
| 463514 | | Ketene; ethenone | 0.5 | 0.9 | | 1.5 | 3 |
| | | Lead arsenate, see Sections 5214 and 5198 | | | | | |
| 7758976 | | Lead chromate, as Pb | -- | 0.02 | | | |
| | | as Cr | -- | 0.005 | | | |
| | | (see also Section 5198, 1532.1, 1532.2, 5206 & 8359) | | | | | |
| | | Lead (metallic) and inorganic compounds, dust and fume, as Pb (see also Section 5198 ) | -- | 0.05 | | | |
| 78002 | | Lead tetraethyl, see Tetraethyl lead | | | | | |
| 75741 | | Lead tetramethyl, see Tetramethyl lead | | | | | |
| 1317653 | | Limestone; calcium carbonate; see Particulates not otherwise regulated | | | | | |
| 58899 | S | Lindane; 1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer | -- | 0.5 | | | |
| 7580678 | | Lithium hydride | -- | 0.025 | | | |
| | | L.P.G.; liquefied petroleum gas | 1,000 | 1,800 | | | |
| 4485125 | | Lithium stearate | -- | 10 | | | |
| 13717005 | | Magnesite; magnesium carbonate; see Particulates not otherwise regulated | | | | | |
| 1309484 | | Magnesium oxide fume, as Mg | -- | 10 | | | |
| 557040 | | Magnesium stearate | -- | 10 | | | |
| 121755 | S | Malathion; o,o-dimethyl S-1(1,2-dicarboethyoxyethyl) phosphorodithioate | -- | 10 | | | |
| 108316 | | Maleic anhydride; cis-butenedioic anhydride | 0.1 | 0.4 | | | |
| | | Manganese and compounds, as Mn | -- | 0.2 | | | |
| 7439965 | | Manganese fume, as Mn | -- | 0.2 | | -- | 3 |
| 12079651 | S | Manganese, cyclopentadienyl-tricarbonyl, as Mn | -- | 0.1 | | | |
| | | Manganese tetroxide | -- | 0.2 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Marble; calcium carbonate; see Particulates not otherwise regulated | | | | | |
| 101779 | S | MDA; see 4,4'-Methylene dianiline | | | | | |
| 101688 | | MDI; see Methylene bis(phenylisocyanate) | | | | | |
| 7439976 | S | Mercury alkyls, as Hg | -- | 0.01 | 0.04 mg/M$^3$ | -- | 0.03 |
| 7439976 | S | Mercury, metallic and inorganic compounds as Hg | -- | 0.025 | 0.1 mg/M$^3$ | | |
| 7439976 | S | Mercury aryl compounds as Hg | -- | 0.01 | C | | |
| 108678 | | Mesitylene; see 1,3,5-Trimethylbenzene | | | | | |
| 141797 | | Mesityl oxide; 4-methyl-3-pentene-2-one | 15 | 60 | | 25 | 100 |
| 79414 | S | Methacrylic acid | 20 | 70 | | | |
| 74828 | | Methane | (h) | -- | | | |
| 74931 | | Methanethiol; see Methyl mercaptan | | | | | |
| 67561 | | Methanol; see Methyl alcohol | | | | | |
| 16752775 | S | Methomyl | -- | 2.5 | | | |
| 72435 | | Methoxychlor; 1,1,1-trichloro-2, 2-bis(p-methoxyphenyl)ethane | -- | 10 | | | |
| 109864 | S | 2-Methoxyethanol | 5 | 16 | | | |
| 110496 | | 2-Methoxyethyl acetate | 5 | 24 | | | |
| 76380 | | Methoxyflurane | 2 | 13 | | | |
| 150765 | | 4-Methoxyphenol | -- | 5 | | | |
| 79209 | | Methyl acetate | 200 | 610 | | 250 | 760 |
| 74997 | | Methyl acetylene; propyne | 1,000 | 1,650 | | | |
| | | Methyl acetylene-propadiene mixture; MAPP | 1,000 | 1,800 | | 1250 | 2250 |
| 96333 | S | Methyl acrylate | 10 | 35 | | | |
| 126987 | S | alpha-Methylacrylonitrile | 1 | 3 | | | |
| 624419 | | 2-Methylbutyl acetate; see Pentyl acetate | | | | | |
| 109875 | | Methylal; dimethoxymethane | 1,000 | 3,100 | | | |
| 67561 | S | Methyl alcohol; methanol | 200 | 260 | 1000 ppm | 250 | 325 |
| 74895 | | Methylamine | 5 | 6.4 | | 15 | 19 |
| 108112 | | Methyl amyl alcohol; see Methyl isobutyl carbinol | | | | | |
| 110430 | | Methyl n-amyl ketone; 2-heptanone | 50 | 235 | | | |
| 100618 | S | N-Methylaniline; monomethylaniline | 0.5 | 2 | | | |
| 95534 | | o-Methylaniline; see o-Toluidine | | | | | |
| 74839 | S | Methyl bromide | 1 | 3.88 | 20 ppm | | |
| 591786 | S | Methyl butyl ketone; 2-hexanone | 5 | 20 | | | |
| 74873 | | Methyl chloride | 50 | 105 | 300 ppm | 100 | 210 |
| 71556 | | Methyl chloroform; 1,1,1-trichloroethane | 350 | 1900 | 800 ppm | 450 | 2450 |
| 107302 | | Methyl chloromethyl ether; see Section 5209 | | | | | |
| 75058 | | Methyl cyanide; see Acetonitrile | | | | | |
| 137053 | | Methyl 2-cyanoacrylate | 0.2 | 0.908 | | 4 | |
| 108872 | | Methylcyclohexane | 400 | 1,600 | | | |
| 25639423 | | Methylcyclohexanol (meta- and para-isomer mixture) | 50 | 235 | | | |
| 583608 | S | o-Methylcyclohexanone | 50 | 230 | | 75 | 345 |
| 12108133 | S | 2-Methylcyclopentadienyl manganese tricarbonyl, as Mn | -- | 0.2 | | | |
| 8022002 | S | Methyl demeton; a mixture of o,o-dimethyl o-(2-(ethylthio)ethyl) phosphorothioate and o,o-dimethyl S-(2-(ethylthio)-ethyl) phosphorothioate | -- | 0.5 | | | |
| 101144 | S | 4,4'-Methylene bis(2-chloroaniline), see also Section 5215 | -- | 0.01 | | | |
| 5124301 | | Methylene bis(4-cyclohexylisocyanate); | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | hydrogenated MDI | 0.005 | 0.054 | | | |
| 101688 | | Methylene bis(phenylisocyanate); MDI; diphenylmethane diisocyanate | 0.005 | 0.051 | | | |
| 75092 | | Methylene chloride; dichloromethane (see also section 5202) | 25 | 87 | | 125 | 435 |
| 101779 | S | 4,4'-Methylene dianiline; MDA (see also Sections 1535 and 5200 ) | 0.01 | 0.08 | | 0.1 | 0.8 |
| 78933 | | Methyl ethyl ketone; MEK; 2-butanone; ethyl methyl ketone | 200 | 590 | | 300 | 885 |
| 1338234 | | Methyl ethyl ketone peroxide | 0.2 | 1.5 | C | | |
| 107313 | | Methyl formate | 100 | 250 | | 150 | 375 |
| 60344 | S | Methyl hydrazine; monomethyl hydrazine | 0.01 | 0.019 | | | |
| 74884 | S | Methyl iodide | 2 | 10 | | | |
| 110123 | | Methyl isoamyl ketone | 50 | 234 | | | |
| 108112 | S | Methyl isobutyl carbinol; 4-methyl-2-pentanol; methyl amyl alcohol | 25 | 100 | | 40 | 165 |
| 108101 | | Methyl isobutyl ketone; Hexone | 50 | 205 | | 75 | 300 |
| 624839 | S | Methyl isocyanate | 0.02 | 0.05 | | | |
| 563804 | | Methyl isopropyl ketone | 200 | 705 | | | |
| 74931 | | Methyl mercaptan | 0.5 | 1 | | | |
| 80626 | | Methyl methacrylate; methyl 2-methyl-2-propenoate | 50 | 205 | | 100 | 410 |
| 298000 | S | Methyl parathion; o,o-dimethyl o-(p-nitrophenyl) phosphorothioate | -- | 0.2 | | | |
| 107879 | | Methyl propyl ketone; 2-pentanone | 200 | 700 | | 250 | 875 |
| 681845 | | Methyl silicate; tetramethyl silicate | 1 | 6 | | | |
| 98839 | | alpha-Methylstyrene; 1-methyl-1-phenylethene | 50 | 240 | | 100 | 485 |
| 77781 | | Methyl sulfate; see Dimethyl sulfate | | | | | |
| 1634044 | | Methyl tert-butyl ether; MTBE | 40 | 144 | | | |
| 21087649 | | Metribuzin | -- | 5 | | | |
| 7786347 | S | Mevinphos; 2-carbomethoxyl-1-propen-2-yl dimethyl phosphate | 0.01 | 0.1 | | 0.03 | 0.3 |
| | | Mica, see Silicates | | | | | |
| | | Mineral wool fiber; see Particulates not otherwise regulated | | | | | |
| 7439987 | | Molybdenum, insoluble compounds, as Mo | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction [n] | -- | 3 | | | |
| | | Molybdenum, soluble compounds, as Mo | -- | 0.5[n] | | | |
| 6923224 | | Monocrotophos | -- | 0.25 | | | |
| 100618 | | Monomethylaniline; see N-Methylaniline | | | | | |
| 60344 | | Monomethylhydrazine; see Methyl hydrazine | | | | | |
| 110918 | S | Morpholine; tetrahydro-4H-1, 4-oxazine | 20 | 70 | | 30 | 105 |
| 7647010 | | Muriatic acid; see Hydrogen chloride | | | | | |
| 300765 | S | Naled; o,o-dimethyl o-(1,2-dibromo-2,2-dichloroethyl) phosphate | -- | 3 | | | |
| 8030317 | | Naphtha, coal tar | 100 | 400 | | | |
| 91203 | | Naphthalene | 10 | 50 | | 15 | 75 |
| 134327 | | alpha-Naphthylamine; 1-naphthylamine, see Section 5209 | | | | | |
| 91598 | | beta-Naphthylamine; 2-naphthylamine, see Section 5209 | | | | | |
| 63252 | | 1-Naphthyl N-methylcarbamate; see Carbaryl | | | | | |
| 25551284 | | Naphthalene diisocyanate; NDI | 0.01 | 0.085 | C | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7440019 | | Neon | (h) | | | | |
| 13463393 | | Nickel carbonyl; Ni $(CO)_4$ | 0.001 | 0.007 | | | |
| 7440020 | | Nickel metal, as Ni | -- | 1 | | | |
| | | Nickel, insoluble compounds, as Ni | -- | 1 | | | |
| | | Nickel, soluble compounds, as Ni | -- | 0.1 | | | |
| 54115 | S | Nicotine; 1-methyl-2-(3-pyridyl)-pyrrolidine | 0.075 | 0.5 | | | |
| 1929824 | | Nitrapyrin | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 7697372 | | Nitric acid | 2 | 5 | | 4 | 10 |
| 10102439 | | Nitric oxide; NO | 25 | 30 | | | |
| 100016 | S | p-Nitroaniline | -- | 3 | | | |
| 98953 | S | Nitrobenzene | 1 | 5 | | | |
| 100005 | S | p-Nitrochlorobenzene; | | | | | |
| | | 1-chloro-4-nitrobenzene | 0.1 | 0.64 | | | |
| 92933 | | 4-Nitrodiphenyl, see Section 5209 | | | | | |
| 79243 | | Nitroethane | 100 | 310 | | | |
| 7727379 | | Nitrogen | (h) | -- | | | |
| 10102440 | | Nitrogen dioxide | | | | 1 | 1.8 |
| | | Nitrogen tetroxide; $N_2O_4$; see Nitrogen dioxide | | | | | |
| 7783542 | | Nitrogen trifluoride | 10 | 29 | | | |
| 55630 | S | Nitroglycerin | | (k) | | -- | 0.1 |
| 75525 | | Nitromethane | 2 | 5 | | | |
| 108032 | | 1-Nitropropane | 25 | 90 | | | |
| 79469 | | 2-Nitropropane | 10 | 35 | | | |
| 62759 | | N-Nitrosodimethylamine, see Section 5209 | | | | | |
| 1321126, 99081, 88722, 99990 | S | Nitrotoluene | 2 | 11 | | | |
| 76062 | | Nitrotrichloromethane; see Chloropicrin | | | | | |
| 10024972 | | Nitrous oxide | 50 | 90 | | | |
| 111842 | | Nonane | 200 | 1,050 | | | |
| | | Nuisance particulates, see Particulates not otherwise regulated | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 2234131 | S | Octachloronaphthalene | -- | 0.1 | | -- | 0.3 |
| 111659 | | Octane | 300 | 1,450 | | 375 | 1800 |
| 8012951 | | Oil (mineral) mist, particulate | -- | (5)[l] | | | |
| | | Oil (vegetable) mists (except castor, cashew nut or similar irritant oils); see Nuisance particulates | | | | | |
| | | Organic arsenic compounds; see Arsenic, organic | | | | | |
| 20816120 | | Osmium tetroxide, as Os | 0.0002 | 0.002 | | 0.0006 | 0.006 |
| 144627 | | Oxalic acid | -- | 1 | | -- | 2 |
| 7783417 | | Oxygen difluoride | 0.05 | 0.1 | C | | |
| 10028156 | | Ozone | 0.1 | 0.2 | | 0.3 | 0.6 |
| 8002742 | | Paraffin wax fume | -- | 2 | | | |
| 1910425, 2074502 | S | Paraquat, total particulates | -- | 0.5 | | | |
| 1910425, 2074502 | S | Paraquat, respirable sizes | -- | 0.1[n] | | | |
| 56382 | S | Parathion; o,o-diethyl o-(p-nitrophenyl) | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | phosphorothioate | -- | 0.1 | | | |
| | | Particulates not otherwise regulated | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| | | Particulate polycyclic; aromatic hydrocarbons (PPAH) see Coal tar pitch volatiles | | | | | |
| | | PCB; see Chlorodiphenyl | | | | | |
| 87865 | S | PCP; see Pentachlorophenol | | | | | |
| 19624227 | | Pentaborane | 0.005 | 0.01 | | 0.015 | 0.03 |
| 1321648 | S | Pentachloronaphthalene | -- | 0.5 | | | |
| 87865 | S | Pentachlorophenol; PCP | -- | 0.5 | | | |
| 115775 | | Pentaerythritol; tetrakis-(hydroxymethyl)methane; tetra-methylolmethane; see Particulates not otherwise regulated | | | | | |
| 109660 | | Pentane | 600 | 1,800 | | | |
| 107879 | | 2-Pentanone; see Methyl propyl ketone | | | | | |
| 628637; 626380; 123922; 625161; 620111; 624419 | | Pentyl acetate | 50 | 266 | | 100 | 532 |
| 67721 | | Perchloroethane; see Hexachloroethane | | | | | |
| 127184 | | Perchloroethylene | 25 | 170 | 300 ppm | 100 | 685 |
| 594423 | | Perchloromethyl mercaptan; trichloromethanethiol | 0.1 | 0.8 | | | |
| 7616946 | | Perchloryl fluoride; $C1O_3F$ | 3 | 14 | | 6 | 28 |
| 382218 | | Perfluoroisobutylene | 0.01 | 0.082 | C | | |
| | | Perlite | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 108952 | S | Phenol | 5 | 19 | | | |
| 92842 | S | Phenothiazine; dibenzothiazine | -- | 5 | | | |
| 106503 | S | p-Phenylenediamine | -- | 0.1 | | | |
| 101848 | | Phenyl ether, vapor | 1 | 7 | | | |
| 100425 | | Phenylethylene; see Styrene | | | | | |
| 122601 | S | Phenyl glycidyl ether, PGE;1,2-epoxy-3-phenoxypropane | 0.1 | 0.6 | | | |
| 100630 | S | Phenylhydrazine | 5 | 20 | | 10 | 45 |
| 108985 | | Phenyl mercaptan | 0.5 | 2 | | | |
| 638211 | | Phenylphosphine | 0.05 | 0.25 | C | | |
| 298022 | S | Phorate; o,o-diethyl S-(ethylthio)methyl phosphorodithioate | -- | 0.05 | | -- | 0.2 |
| 75445 | | Phosgene; carbonyl chloride; $COCl_2$ | 0.1 | 0.4 | | | |
| 7803512 | | Phosphine; $PH_3$ | 0.3 | 0.4 | | 1 | 1 |
| 7664382 | | Phosphoric acid | -- | 1 | | -- | 3 |
| 7723140 | | Phosphorus, yellow | -- | 0.1 | | | |
| 10025873 | | Phosphorus oxychloride | 0.1 | 0.6 | | | |
| 10026138 | | Phosphorus pentachloride | 0.1 | 1 | | | |
| 1314803 | | Phosphorus pentasulfide; $P_2S_5$ | -- | 1 | | -- | 3 |
| 7719122 | | Phosphorus trichloride | 0.2 | 1.5 | | 0.5 | 3 |
| 85449 | | Phthalic anhydride | 1 | 6 | | | |
| 626175 | | m-Phthalodinitrile | -- | 5 | | | |
| 1918021 | | Picloram | -- | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 88891 | S | Picric acid; 2,4,6-trinitrophenol | -- | 0.1 | | | |
| 83261 | | Pindone; 2-pivalyl-1, 3-indandione | | 0.1 | | | |
| 142643 | | Piperazine dihydrochloride | -- | 5 | | | |
| 26499650 | | Plaster of Paris; calcium sulfate hemihydrate; see Particulates not otherwise regulated | | | | | |
| 7440064 | | Platinum, metal | -- | 1 | | | |
| | | Platinum, soluble salts, as Pt | -- | 0.002 | | | |
| | | Polychlorobiphenyls, see Chlorodiphenyl | | | | | |
| | | Polytetrafluoroethylene, decomposition products | -- | (m) | | | |
| | | Portland Cement; see Particulates not otherwise regulated | | | | | |
| 1310583 | | Potassium hydroxide; caustic potash | -- | 2 | C | | |
| 593293 | | Potassium stearate | -- | 10 | | | |
| 74986 | | Propane | 1000 | 1800 [h] | | | |
| 107197 | S | Propargyl alcohol; 2-propyn-1-o1 | 1 | 2 | | | |
| 57578 | | beta-Propiolactone, see Section 5209 | 0.5 | 1.5 | | | |
| 79094 | | Propionic acid | 10 | 30 | | | |
| 114261 | | Propoxur; 2-isopropoxyphenyl N-methyl carbamate | | 0.5 | | | |
| 109604 | | n-Propyl acetate | 200 | 840 | | 250 | 1050 |
| 71238 | S | n-Propyl alcohol | 200 | 500 | | 250 | 625 |
| 115071 | | Propylene | (h) | -- | | | |
| 78875 | | Propylene dichloride; 1,2-dichloropropane | 75 | 350 | | 110 | 510 |
| 6423434 | S | Propylene glycol dinitrate; PGDN | 0.05 | 0.3 | | | |
| 107982 | S | Propylene glycol monomethyl ether | 100 | 360 | | 150 | 540 |
| 108656 | S | Propylene glycol monomethyl ether acetate | 100 | 541 | | 150 | 811 |
| 75558 | S | Propyleneimine; 2-methylaziridine | 2 | 5 | | | |
| 75569 | | Propylene oxide; 1,2-epoxy-propane | 2 | 4.75 | | | |
| 627134 | | n-Propyl nitrate | 25 | 107 | | 40 | 170 |
| 74997 | | Propyne; see Methylacetylene | | | | | |
| 8003347 | | Pyrethrum | -- | 5 | | | |
| 110861 | | Pyridine | 5 | 15 | | | |
| 106514 | | Quinone | 0.1 | 0.4 | | | |
| 121824 | | RDX; see Cyclonite | | | | | |
| 108463 | | Resorcinol | 10 | 45 | | 20 | 90 |
| 7440166 | | Rhodium, metal | -- | 0.1 | | | |
| | | Insoluble compounds, as Rh | -- | 0.1 | | | |
| | | Soluble salts, as Rh | -- | 0.001 | | | |
| 299843 | | Ronnel; o,o-dimethyl o-(2,4,5-trichlorophenyl) phosphorothioite | -- | 10 | | | |
| | | Rosin core solder, pyrolysis products, as formaldehyde | -- | 0.1 | | | |
| 83794 | | Rotenone, commercial | -- | 5 | | | |
| 1309371 | | Rouge; see Particulates not otherwise regulated | | | | | |
| | | Rubber solvent (Naphtha) | 400 | 1,600 | | | |
| | | Selenium compounds, as Se | -- | 0.2 | | | |
| 7783791 | | Selenium hexafluoride | 0.05 | 0.4 | | | |
| 136787 | | Sesone; sodium 2,4-dichloro-phenoxyethyl sulfate | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 61790532 | | Silica, amorphous | | | | | |
| | | Diatomaceous earth | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total dust | -- | 6 | | | |
| | | Respirable fraction[n] | -- | 3 | | | |
| | | Precipitated and gel | -- | 6 | | | |
| | | Silica, crystalline | | | | | |
| 14464461 | | Cristobalite, respirable dust | -- | 0.05 | | | |
| 14808607 | | Quartz, respirable dust | -- | 0.1 | | | |
| 14808607 | | Quartz, total dust | -- | 0.3 | | | |
| 60676860 | | Silica, fused, respirable dust | -- | 0.1 | | | |
| 15468323 | | Tridymite, respirable dust | -- | 0.05 | | | |
| 1317959 | | Tripoli, respirable dust | -- | 0.1 | | | |
| | | Silicates (<1% crystalline silica) | | | | | |
| 12001262 | | Mica (respirable dust) | -- | 3 | | | |
| | | Soapstone, total dust | -- | 6 | | | |
| | | Soapstone, respirable dust | -- | 3 | | | |
| | | Talc (containing asbestos); see Section 5208 | | | | | |
| 14807966 | | Talc (containing no asbestos fibers), respirable dust | -- | 2 | | | |
| | | Tremolite (containing no asbestos fibers), respirable dust | -- | 2 | | | |
| 7440213 | | Silicon; see Particulates not otherwise regulated | | | | | |
| 409212 | | Silicon carbide; SiC; see Particulates not otherwise regulated | | | | | |
| 7803625 | | Silicon tetrahydride; silane | 5 | 7 | | | |
| 7440224 | | Silver metal, as Ag | -- | 0.01 | | | |
| | | Silver, soluble compounds, as Ag | -- | 0.01 | | | |
| | | Soapstone, see Silicates | | | | | |
| 26628228 | S | Sodium azide | 0.1 | 0.3 | C | | |
| 7631905 | | Sodium bisulfite | -- | 5 | | | |
| 136787 | | Sodium 2,4-dichlorophenoxyethyl sulfate; see Sesone | | | | | |
| 62748 | S | Sodium fluoroacetate | -- | 0.05 | | -- | 0.15 |
| 1310732 | | Sodium hydroxide; caustic soda | -- | 2 | C | | |
| 7681574 | | Sodium metabisulfite | -- | 5 | | | |
| 822162 | | Sodium stearate | -- | 10 | | | |
| 9005258 | | Starch; see Particulates not otherwise regulated | | | | | |
| 7789062 | | Strontium chromate, as Cr (see also Sections 1532.2, 5206 & 8359) | -- | 0.0005 | | | |
| | | Stearates; see specific compound | | | | | |
| 7803523 | | Stibine; $SbH_3$ | 0.1 | 0.5 | | | |
| 8052413 | | Stoddard solvent | 100 | 525 | | | |
| 57249 | | Strychnine | -- | 0.15 | | | |
| 100425 | S | Styrene (monomer); phenylethylene | 50 | 215 | 500 ppm | 100 | 425 |
| 9014011 | | Subtilisins (as pure crystalline proteolytic enzymes) | -- | | | | 0.00006[r] |
| 57501 | | Sucrose; see Particulates not otherwise regulated | | | | | |
| 74222972 | | Sulfometuron methyl | -- | 3.5 | | | |
| 3689245 | S | Sulfotep; tetraethyl dithionopyrophosphate | | 0.2 | | | |
| 7446095 | | Sulfur dioxide | 2 | 5 | | 5 | 10 |
| 2551624 | | Sulfur hexafluoride | 1,000 | 6,000 | | | |
| 7664939 | | Sulfuric acid | -- | 1 | | -- | 3 |
| 10025679 | | Sulfur monochloride; $S_2Cl_2$ | 1 | 6 | C | | |
| 5714227 | | Sulfur pentafluoride; $S_2F_{10}$ | 0.01 | 0.1 | C | | |
| 7783600 | | Sulfur tetrafluoride | 0.1 | 0.4 | C | | |
| 2699798 | | Sulfuryl fluoride; $SO_2F_2$ | 5 | 20 | | 10 | 40 |
| 35400432 | | Sulprofos | | 1 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 93765 | | 2,4,5-T;2,4,5-trichlorophenoxyacetic acid | -- | 10 | | | |
| | | Talc; see Silicates | | | | | |
| 7440257 | | Tantalum metal dust, as Ta | -- | 5 | | | |
| 1314610 | | Tantalum oxide dust, as Ta | -- | 5 | | | |
| 78308 | | TCP; see Triorthocresyl phosphate | | | | | |
| 584849 | | TDI; see Toluene-2,4-diisocyanate | | | | | |
| 3689245 | S | TEDP; see Sulfotep | | | | | |
| | | Tellurium and compounds, as Te | -- | 0.1 | | | |
| 7783804 | | Tellurium hexafluoride | 0.02 | 0.2 | | | |
| 3383968 | | Temephos; o,o,o' ,o'-tetramethyl o,o'-thiodi-p-phenylene phosphorothioate | | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 107493 | S | TEPP; tetraethyl pyrophosphate; | 0.004 | 0.05 | | | |
| 100210 | | Terephthalic acid | -- | 10 | | | |
| | | Terphenyls | 0.5 | 5 | C | | |
| 79276 | | 1,1,2,2-Tetrabromoethane; see Acetylene tetrabromide | | | | | |
| 76119 | | 1,1,1,2-Tetrachloro-2,2-difluoroethane | 500 | 4170 | | | |
| 76120 | | 1,1,2,2-Tetrachloro-1,2-difluoroethane; fluorocarbon 112 | 500 | 4,170 | | | |
| 79345 | S | 1,1,2,2-Tetrachloroethane; acetylene tetrachloride | 1 | 7 | | | |
| 127184 | | Tetrachloroethylene; see Perchloroethylene | | | | | |
| 56235 | | Tetrachloromethane; see Carbon tetrachloride | | | | | |
| 1335882 | S | Tetrachloronaphthalene | -- | 2 | | | |
| 3689245 | | Tetraethyl dithionopyrophosphate; see Sulfotep | | | | | |
| 78002 | S | Tetraethyl lead; tetraethylplumbane, as Pb | -- | 0.075 | | | |
| 107493 | | Tetraethyl pyrophosphate; see TEPP | | | | | |
| 109999 | | Tetrahydrofuran | 200 | 590 | | 250 | 735 |
| 75741 | S | Tetramethyl lead; tetramethylplumbane, as Pb | -- | 0.075 | | | |
| 115775 | | Tetramethylolmethane; see Pentaerythritol | | | | | |
| 3333526 | S | Tetramethyl succinonitrile (decomposition product of 2,2'-azobisisobutyronitrile) | 0.5 | 3 | | | |
| 137268 | | Tetramethyl thiuram disulfide, see Thiram | | | | | |
| 509148 | | Tetranitromethane | 0.005 | 0.04 | | | |
| 7722885 | | Tetrasodium pyrophosphate | -- | 5 | | | |
| 479458 | S | Tetryl; 2,4,6-trinitrophenylmethylnitramine | -- | 1.5 | | | |
| | S | Thallium, soluble compounds, as Tl | -- | 0.1 | | | |
| 109999 | | THF; see Tetrahydrofuran | | | | | |
| 96695 | | 4,4'-Thiobis(6-tert-butyl-m-cresol) | -- | | | | |
| | | Total dust | -- | 10 | | | |
| | | Respirable fraction[n] | -- | 5 | | | |
| 68111 | S | Thioglycolic acid | 1 | 3.8 | | | |
| 7719097 | | Thionyl chloride | 1 | 5 | C | | |
| 137268 | | Thiram; bis(dimethylthiocarbamoyl) disulfide | -- | 5 | | | |
| | S | Tin, organic compounds, as Sn | -- | 0.1 | | -- | 0.2 |
| 21651194 | | Tin, tin oxide and inorganic compounds, except $SnH_4$, as Sn | -- | 2 | | | |
| 13463677 | | Titanium dioxide, as Ti; see Particulates not otherwise regulated | | | | | |
| 137268 | | TMTD; see Thiram | | | | | |
| 118967 | | TNT; see 2,4,6-Trinitrotoluene | | | | | |
| 108883 | S | Toluene; toluol | 50 | 188 | 500 ppm | 150 | 560 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 584849 | | Toluene-2,4-diisocyanate; TDI | 0.005 | 0.04 | 0.02 ppm | 0.02 | 0.15 |
| 108441 | S | m-Toluidine | 2 | 9 | | | |
| 95534 | S | o-Toluidine; o-methylaniline | 2 | 9 | | | |
| 106490 | S | p-Toluidine | 2 | 9 | | | |
| 8001352 | | Toxaphene; see Chlorinated camphene | | | | | |
| 115866 | | TPP; see Triphenyl phosphate | | | | | |
| | | Tremolite, nonasbestiform; see Silicates | | | | | |
| 75252 | | Tribromomethane; see Bromoform | | | | | |
| 126738 | | Tributyl phosphate | 0.2 | 2.5 | | | |
| 76039 | | Trichloroacetic acid | 1 | 5 | | | |
| 120821 | | 1,2,4-Trichlorobenzene | 5 | 40 | C | | |
| 50293 | | 1,1,1,-Trichloro-2,2-bis(p-chlorophenyl)ethane; see DDT | | | | | |
| 71556 | | 1,1,1-Trichloroethane; see Methyl chloroform | | | | | |
| 79005 | S | 1,1,2-Trichloroethane | 10 | 45 | | | |
| 79016 | | Trichloroethylene; trichloroethene | 25 | 135 | 300 ppm | 100 | 537 |
| 75694 | | Trichlorofluoromethane; Fluorocarbon 11 | 1,000 | 5,600 | C | | |
| 67663 | | Trichloromethane; see Chloroform | | | | | |
| 594423 | | Trichloromethanethiol; see Perchloromethyl mercaptan | | | | | |
| 1321659 | S | Trichloronaphthalene | -- | 5 | | | |
| 76062 | | Trichloronitromethane; see Chloropicrin | | | | | |
| 93765 | | 2,4,5-Trichlorophenoxyacetic acid see 2,4,5-T | | | | | |
| 96184 | | 1,2,3-Trichloropropane | 10 | 60 | | | |
| 76131 | | 1,1,2-Trichloro-1,2,2- trifluoroethane | 1000 | 7600 | 2000 ppm | 1250 | 9500 |
| 78308 | | Tricresyl phosphate; see Triorthocresyl phosphate | | | | | |
| 13121705 | | Tricyclohexyltin hydroxide; see Cyhexatin | | | | | |
| 102716 | | Triethanolamine | -- | 5 | | | |
| 121448 | S | Triethylamine | 1 | 4.1 | C | | |
| 112492 | S | Triethylene glycol dimethyl ether, Triglyme | 5 | 36 | | | |
| 75638 | | Trifluorobromomethane | 1,000 | 6,100 | | | |
| 2451629 | | 1,3,5-Triglycidyl-s-triazinetrione | | 0.005 | | | |
| 552307 | | Trimellitic anhydride | 0.005 | 0.04 | C | | |
| 75503 | | Trimethylamine | 5 | 12 | | 15 | 36 |
| | | Trimethylbenzene, all isomers | 25 | 125 | | | |
| 121459 | | Trimethyl phosphite | 2 | 10 | | | |
| 88891 | | 2,4,6-Trinitrophenol; see Picric acid | | | | | |
| 479458 | | 2,4,6-Trinitrophenylmethyl nitramine; see Tetryl | | | | | |
| 118967 | S | 2,4,6-Trinitrotoluene; TNT | -- | 0.5 | | | |
| 78308 | S | Triorthocresyl phosphate | -- | 0.1 | | | |
| 603349 | | Triphenylamine | -- | 5 | | | |
| 115866 | S | Triphenyl phosphate; TPP | -- | 3 | | | |
| 7440337 | | Tungsten metal, as W | -- | 5 | | | |
| | | Tungsten, insoluble compounds, as W | -- | 5 | | -- | 10 |
| | | Tungsten, soluble compounds, as W | -- | 1 | | -- | 3 |
| 8006642 | | Turpentine | 100 | 560 | | | |
| | | Uranium (natural), insoluble compounds, as U | -- | 0.2 | | -- | 0.6 |
| | | Uranium (natural), soluble compounds, as U | -- | 0.05 | | | |
| 110623 | | Valeraldehyde | 50 | 175 | | | |
| 1314621 | | Vanadium pentoxide ($V_2O_5$), respirable dust and fume | -- | 0.05[n] | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 75014 | S | VC; see Vinyl chloride, Section 5210 | | | | | |
| | | Vegetable oil mists (except castor, cashew nut or similar irritant oils); see Particulates not otherwise regulated | | | | | |
| 108054 | | Vinyl acetate | 10 | 30 | | 15 | 45 |
| 100425 | | Vinylbenzene; see Styrene | | | | | |
| 593602 | | Vinyl bromide; bromoethylene | 5 | 20 | | | |
| 75014 | S | Vinyl chloride, see Section 5210 | 1 | | | | |
| 107131 | S | Vinyl cyanide, see Acrylonitrile, Section 5213 | | | | | |
| 100403 | S | 4-Vinyl cyclohexene | 0.1 | 0.4 | | | |
| 106876 | S | Vinyl cyclohexene dioxide | 0.1 | 0.57 | | | |
| 75354 | | Vinylidene chloride; 1,1-dichloroethylene | 1 | 4 | | | |
| 75387 | | Vinylidene fluoride | 100 | 262 | | | |
| 25013154 | | Vinyltoluene | 50 | 240 | | | |
| 8030306 | | VM & P (Varnish Makers and Painters) Naphtha | 300 | 1,350 | | 400 | 1800 |
| 81812 | | Warfarin; 3-(alpha-acetonyl-benzyl)-4-hydroxycoumarin | -- | 0.1 | | | |
| | | Welding fumes; total particulates (see also individual constituents) | -- | 5 | | | |
| | | Wood dust | -- | | | | |
| | | All soft and hard woods, except Western red cedar | -- | 5 | | -- | 10 |
| | | Wood dust, Western red cedar-- | -- | 2.5 | | | |
| 1330207 | | Xylene; xylol; dimethylbenzene | 100 | 435 | 300 ppm | 150 | 655 |
| 1477550 | S | m-Xylene-a,a'-diamine | -- | 0.1 | C | | |
| 1300738 | S | Xylidine; aminodimethylbenzene | 0.5 | 2.5 | | | |
| | | Yttrium compounds, as Y | -- | 1 | | | |
| 7646857 | | Zinc chloride fume | -- | 1 | | -- | 2 |
| 13530659 | | Zinc chromate, as Cr (see also Sections 1532.2, 5206 & 8359) | -- | 0.005 | | | |
| 15930946 | | Zinc chromate hydroxide, as Cr (see also Sections 1532.2, 5206 & 8359) | -- | 0.005 | | | |
| 1314132 | | Zinc oxide fume | -- | 5 | | -- | 10 |
| | | Zinc oxide dust, see Particulates not otherwise regulated | | | | | |
| 11103869 | | Zinc potassium chromate, as Cr (see also Sections 1532.2, 5206 & 8359) | -- | 0.005 | | | |
| 557051 | | Zinc stearate | -- | 10 | | | |
| 37300235 | | Zinc yellow, as Cr (see also Sections 1532.2, 5206 & 8359) | -- | 0.005 | | | |
| | | Zirconium compounds, as Zr | -- | 5 | | -- | 10 |

S

Footnotes to Table AC-1

(a) The Chemical Abstracts Service Registry Number is a designation used to identify a specific compound or substance regardless of the naming system; these numbers were obtained from the Desk Top Analysis Tool for the Common Data Base and from the Chemical Abstracts Indexes.

(b) Refer to section 5155(d) for the significance of the Skin notation.

(c) Trade Names Removed from Table AC-1.

| Trade Name | | Chemical/Generic Name |
|---|---|---|
| Abate | see | Temephos |
| Ammate | see | Ammonium Sulfamate |
| Aqualin | see | Acrolein |
| Arasan | see | Thiram |
| Azodrin | see | Moncrotophos |
| Baygon | see | Propoxur |
| Bidrin | see | Dicrotophos |
| Butyl Cellosolve | see | 2-Butoxyethanol |
| Cellosolve | see | 2-Ethoxyethanol |
| Cellosolve Acetate | see | 2-Ethoxyethyl acetate |
| Compound 1080 | see | Sodium Fluoracetate |
| Coyden | see | Clopidol |
| Crag Herbicide | see | Sesone |
| Cythion | see | Malathion |
| Dasanit | see | Fensulfothion |
| Delnav | see | Dioxathion |
| Dibrom | see | Naled |
| Difolatan | see | Captafol |
| Disyston | see | Disulfoton |
| Dowtherm A | see | Phenylether and Biphenyl |
| Dursban | see | Chloropyrifos |
| Dyfonate | see | Fonofos |
| Fermate | see | Ferbam |
| Freons | see | Fluorocarbons |
| Furadan | see | Carbofuran |
| Guthion | see | Azinphos Methyl |
| Korlan | see | Ronnel |
| Lannate | see | Methomyl |
| Mariate | see | Methoxychlor |
| MLT | see | Malathion |
| Moxie | see | Methoxychlor |
| Nialate | see | Ethion |
| Nankor | see | Ronnel |
| Phosdrin | see | Mevinphos |
| Pival | see | Pindone |
| Plictran | see | Cyhexatin |
| Santobrite | see | Pentachlorophenol |
| Sevin | see | Carbaryl |
| Systox | see | Demeton |
| Teflon | see | Polytetrafluoroethylene |
| Thimet | see | Phorate |
| Thiodan | see | Endosulfan |
| Tordon | see | Picloram |
| Trolene | see | Ronnel |
| Vapona | see | Dichlorvos |
| Weedone 638 | see | 2, 4-D |
| Zoalene | see | Dinitolmide |

(d) For the definition and the application of the Permissible Exposure Limit (PEL), refer to section 5155(b) and (c)(1).

(e) Parts of gas or vapor per million parts of air by volume at 25oC and 760mm Hg pressure.

(f) Milligrams of substance per cubic meter of air at 25oC and 760mm Hg pressure.

(g) Refer to section 5155(b) and (c)(3) for the significance of the Ceiling notation. A "C" notation in this column means the values given in the PEL columns are ceiling values. A numerical entry in this column represents a ceiling value in addition to the TWA values.

(h) A number of gases and vapors, when present in high concentrations, act primarily as asphyxiants without other adverse effects. A concentration limit is not included for each material because the limiting factor is the available oxygen. (Several of these materials present fire or explosion hazards.)

(i) Coal tar pitch volatiles (benzene or cyclohexane-soluble fraction) include fused polycyclic hydrocarbons (some of which are known carcinogens) which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the "coal tar pitch volatiles" standard.

(j) This standard applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning, and willowing) and garnetting. It does not apply to cotton gins, cottonseed oil industry, or operations covered by section 5190.

(k) A PEL of 0.05 ppm shall apply to exposures involving a mixture of ethylene glycol dinitrate and nitroglycerin.

(l) As sampled by method that does not collect vapor.

(m) Thermal decomposition of the fluorocarbon chain in air leads to the formation of oxidized products containing carbon, fluorine and oxygen. An index of exposure to these products is possible through their alkaline hydrolysis followed by a quantitative determination of fluoride content. No particular concentration limit is specified pending evaluation of the toxicity of the products but concentrations shall be kept below the sensitivity of the analytical method.

(n) The concentration and percentage of the particulate used for this limit are determined from the fraction passing a size selector with the following characteristics:

| *Aerodynamic Diameter in Micrometers (unit density sphere)* | *Percent Passing Selector* |
|---|---|
| ≤ 2 | 90 |
| 2.5 | 75 |
| 3.5 | 50 |
| 5.0 | 25 |

| | | |
|---|---|---|
| 10 | ..... | 0 |

Source: American Conference of Governmental Industrial Hygienists TLV Committee 1968 Proceedings.

(o) Refer to sections 5155(b) and (c)(2) for the definition and application of the Short Term Exposure Limit (STEL).

(p) (Reserved)

(q) Fibers per cubic centimeter of air at 25oC and 760mm Hg pressure. To be considered a fiber for this limit the glass particle must be longer than 5µm, have a length to diameter ratio of three or more, and have a diameter less than 3µm. The National Institute for Occupational Safety and Health (NIOSH), Method 7400, Issue 2, August 15, 1994, which is hereby incorporated by reference, shall be used for measuring airborne fiber concentrations.

(r) Compliance with the subtilisins PEL is assessed by sampling with a high volume sampler (600-800 liters per minute) for at least 60 minutes.

(s) The concentration and percentage of the particulate used for this limit are determined from the fraction passing a size selector with the following characteristics:

| *Aerodynamic Diameter in Micrometers (unit density sphere)* | | *Percent Passing Selector* |
|---|---|---|
| 0 | ..... | 100 |
| 1 | ..... | 97 |
| 2 | ..... | 94 |
| 5 | ..... | 87 |
| 10 | ..... | 77 |
| 20 | ..... | 65 |
| 30 | ..... | 58 |
| 40 | ..... | 54.5 |
| 50 | ..... | 52.2 |
| 100 | ..... | 50 |

(t) Glutaraldehyde can cause occupational asthma and skin sensitization responses such as contact dermatitis. Exposure related symptoms may include one or more of the following: shortness of breath, chest tightness, wheeze, cough, skin rash, hives, and irritation of the nose, throat, skin or eye. Hazard communication training required by sections 5191 or 5194 shall address these health hazards and symptoms along with the measures taken by the employer to evaluate and control exposures that can include medical evaluations, exposure monitoring, ventilation systems, work practices, and personal protective equipment. The communication system required by section 3203 shall

inform employees where to report possible health symptoms and where to ask questions, report concerns, and receive information about the employer's evaluation and control measures.

**APPENDIX C**
**GLOVE SELECTION GUIDE**

The following guide is a general guide for glove selection in relation to chemicals handled. The information presented here is believed to be accurate; however, we cannot guarantee its accuracy. Many factors affect the breakthrough times of glove materials including, but not limited to:

1. Thickness of glove material
2. Concentration of the chemical worked with
3. Amount of chemical the glove comes in contact with
4. Length of time which the glove is exposed to the chemical
5. Temperature at which the work is done
6. Possibility of abrasion or puncture.

## Some Common Sense Rules for Glove Use

- Select gloves which are resistant to the chemicals you may be exposed to. Consult the relevant Material Safety Data Sheet (MSDS) which may recommend a particular glove material.
- Select gloves of the correct size and fitting; gloves that are too small are uncomfortable and may tear whereas overlarge gloves may interfere with dexterity. In some cases, such as use of HF, it may be advisable to select gloves that can be removed very rapidly in an emergency.
- Before use, check gloves (even new ones) for physical damage such as tears or pin holes and for previous chemical damage: this is especially important when dealing with dangerous materials such as HF.
- When working, it may be advisable to wash the external surface of the gloves frequently with water.
- Some gloves, especially lightweight disposables, may be flammable: keep hands well away from naked flames or other high temperature heat sources.
- When removing gloves, do so in a way that avoids the contaminated exterior contacting the skin.
- Wash hands after removing gloves.
- Dispose of contaminated gloves properly.
- Do not attempt to re-use disposable gloves.
- Never wear possibly contaminated gloves outside of the laboratory or to handle telephones, computer keyboards, *etc*.

This information is provided as a guide to proper glove material selection. Glove performance varies between manufacturers, so always give yourself extra time and do not push glove strength to the estimated limits and consult a certified safety consultant when in doubt to make sure you have the right glove for your application.

Selection Key:

| | |
|---|---|
| 4 | Excellent, breakthrough times generally greater than 8 hours. |
| 3 | Good, breakthrough times generally greater than 4 hours. |
| 2 | Fair, breakthrough times generally greater than 1 hour. |
| 1 | Not Recommended, breakthrough times generally less than 1 hour. |
| ? | Not Tested or Information unknown. Use known tested glove type. |

## GLOVE SELECTION GUIDE

Source: http://www.allsafetyproducts.biz/site/323655/page/74172

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|
| **Chemical** | | | | | | |
| **Organic Acids** | | | | | | |
| Acetic acid | 2 | 3 | 4 | 2 | 1 | 4 |
| Formic acid | 2 | 3 | 4 | 3 | 2 | 2 |
| Lactic Acid | 4 | 4 | 4 | 3 | 4 | 4 |
| Maleic acid | 3 | 3 | 2 | 3 | 3 | 4 |
| Oxalic acid | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | | | | |
| | Natural | Neoprene | Butyl | PVC | Nitrile | Viton® |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Rubber | | | | | |
| **Inorganic acids** | | | | | | |
| Chromic acid up to 70% | 1 | 1 | 4 | 3 | 3 | 4 |
| Hydrochloric acid up to 37% | 3 | 3 | 4 | 3 | 3 | 3 |
| Hydrofluoric acid up to 70% | 2 | 2 | 3 | 1 | 1 | ? |
| Nitric acid 70+ % | ? | 1 | 2 | ? | 1 | 4 |
| Perchloric acid up to 70% | 4 | 4 | 3 | 4 | 4 | 4 |
| Phosphoric acid 70+ % | 4 | 4 | 4 | 4 | 4 | 4 |
| Sulfuric acid 70+ % | 1 | 2 | 4 | 2 | 1 | 2 |
| | | | | | | |
| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
| **Alkalis** | | | | | | |
| Ammonium hydroxide up to 70% | 1 | 3 | 4 | 2 | 3 | ? |
| Potassium hydroxide up to 70% | 4 | 4 | 4 | 4 | 4 | 4 |
| Sodium hydroxide 70+ % | 4 | 4 | 4 | 4 | 3 | 3 |
| | | | | | | |
| | Natural | Neorene | Butyl | PVC | Nitrile | Viton® |

| | Rubber | | | | | |
|---|---|---|---|---|---|---|
| **Salt Solutions** | | | | | | |
| Ammonium nitrate | 4 | 4 | 4 | 4 | 4 | 4 |
| Calcium hypochlorite | 1 | 3 | 4 | 4 | 3 | 4 |
| Ferric chloride | 4 | 4 | 4 | 4 | 4 | 4 |
| Mercuric chloride | 3 | 3 | 4 | 3 | 3 | 4 |
| Potassium cyanide | 4 | 4 | 4 | 4 | 4 | 4 |
| Potassium dichromate | 4 | 4 | 4 | 4 | 4 | 4 |
| Potassium permanganate | 4 | 4 | ? | 4 | 4 | ? |
| Sodium cyanide | 4 | 4 | 4 | 4 | 4 | 4 |
| Sodium thiosulfate | 4 | 4 | 4 | 4 | 4 | 4 |

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|
| **Aromatic hydrocarbons** | | | | | | |
| Benzene | 1 | 1 | 1 | 1 | 1 | 3 |
| Gasoline | 1 | 1 | 1 | 1 | 4 | 4 |
| Naphthalene | 1 | 1 | 1 | 1 | 4 | 4 |
| Toluene | 1 | 1 | 1 | 1 | 1 | 4 |
| Xylene | 1 | 1 | 1 | 1 | 1 | 4 |

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|
| **Aliphatic hydrocarbons** | | | | | | |
| Diesel fuel | 1 | 2 | 1 | 2 | 3 | 4 |
| Hexanes | 1 | 1 | 1 | 1 | 4 | 4 |
| Kerosene | 1 | 3 | 1 | 3 | 4 | 4 |
| Naphtha | 1 | 2 | 1 | 3 | 4 | 4 |
| Pentane | 1 | 1 | 1 | 1 | 3 | 4 |
| Petroleum ether | 1 | 1 | 1 | 2 | 3 | 4 |
| Turpentine | 1 | 1 | 1 | 1 | 2 | 4 |

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|
| **Halogenated hydrocarbons** | | | | | | |
| Carbon tetrachloride | 1 | 1 | 1 | 1 | 1 | 4 |
| Chloroform | 1 | 1 | 1 | 1 | 1 | 4 |
| Methylene chloride | 1 | 1 | 1 | 1 | 2 | 3 |
| Polychlorinated | 1 | 4 | 4 | ? | 2 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| biphenyls (PCB's) | | | | | | |
| Perchloroethylene | 1 | 1 | 1 | 1 | 2 | 4 |
| Trichloroethylene | 1 | 1 | 1 | 1 | 1 | 4 |
| | | | | | | |
| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
| **Esters** | | | | | | |
| Ethyl acetate | 1 | 1 | 3 | 1 | 1 | 1 |
| Butyl acetate | 1 | 1 | 2 | 1 | 1 | 1 |
| Methyl acetate | 1 | 1 | 4 | 1 | 1 | 1 |
| Isobutyl acrylate | 1 | 1 | 4 | 1 | 1 | 1 |
| | | | | | | |
| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
| **Ethers/Glycols** | | | | | | |
| Diethyl ether | 1 | 2 | 1 | 1 | 2 | 1 |
| Ethylene glycol | 1 | 2 | 4 | 1 | 2 | 4 |
| Isopropyl ether | 1 | 2 | 1 | 1 | 3 | 1 |
| Propylene glycol | ? | 3 | 3 | 2 | 2 | ? |
| Tetrahydrofuran | 1 | 1 | 2 | 1 | 1 | 1 |

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|
| **Aldehydes** | | | | | | |
| Acetaldehyde | 1 | 1 | 4 | 1 | 1 | 1 |
| Acrolein | 1 | 1 | 4 | 1 | 1 | 1 |
| Benzaldehyde | 1 | 1 | 4 | 1 | 1 | 3 |
| Butyraldehyde | 1 | 1 | 4 | 1 | 1 | 1 |
| Formaldehyde | 1 | 2 | 4 | 2 | 4 | 4 |
| Glutaraldehyde | ? | 4 | 4 | 2 | ? | 4 |

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|
| **Ketones** | | | | | | |
| Acetone | 1 | 1 | 4 | 1 | 1 | 1 |
| Diisobutyl ketone | 1 | 1 | 2 | 1 | 1 | 2 |
| Methyl ethyl ketone | 1 | 1 | 4 | 1 | 1 | 1 |

| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
|---|---|---|---|---|---|---|

| **Alcohols** | | | | | | |
|---|---|---|---|---|---|---|
| Allyl alcohol | 1 | 1 | 4 | 1 | 4 | 3 |
| Butyl alcohol | 1 | 3 | 4 | 2 | 3 | 4 |
| Ethyl alcohol | 1 | 2 | 4 | 1 | 3 | 4 |
| Isopropyl alcohol | 1 | 3 | 4 | 2 | 4 | 4 |
| Methyl alcohol | 1 | 1 | 4 | 1 | 1 | 4 |
| | | | | | | |
| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
| **Amines** | | | | | | |
| Aniline | 1 | 1 | 4 | 1 | 1 | 2 |
| Ethanolamine | 2 | 4 | 4 | 3 | 4 | 4 |
| Ethylamine | 1 | 2 | 4 | 1 | 1 | 1 |
| Methylamine | 1 | 3 | 4 | 2 | 4 | 4 |
| Triethanolamine | 1 | 1 | 4 | 1 | 4 | 4 |
| | | | | | | |
| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
| **Elements** | | | | | | |
| Bromine | 1 | 2 | 1 | ? | 1 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Chlorine aqueous | ? | 1 | 2 | ? | 1 | 4 |
| Iodine | ? | 1 | 3 | ? | 3 | 4 |
| Mercury | ? | 4 | 4 | ? | 4 | 4 |
| | | | | | | |
| | Natural Rubber | Neoprene | Butyl | PVC | Nitrile | Viton® |
| **Miscellaneous** | | | | | | |
| Acetic anhydride | 1 | 2 | 4 | 1 | 1 | 1 |
| Acetonitrile | 1 | 1 | 4 | 1 | 1 | 1 |
| Acrylamide | 1 | 1 | 3 | 1 | 2 | 3 |
| Carbon disulfide | 1 | 1 | 1 | 1 | 1 | 4 |
| Cresols | 1 | 3 | 4 | ? | 2 | 4 |
| Cutting fluid | ? | 2 | ? | 2 | 3 | ? |
| Dimethyl sulfoxide | 1 | 4 | 4 | 1 | 1 | 1 |
| Hydraulic oil | ? | ? | 1 | 2 | 3 | ? |
| Hydrazine | 2 | 4 | 4 | 4 | 4 | 1 |
| Hydrogen Peroxide | 4 | 2 | 4 | 3 | 4 | 4 |
| Lubricating oil | 3 | 3 | ? | ? | 4 | 3 |
| Malathion | ? | 3 | 1 | ? | 3 | ? |
| Nitrobenzene | 1 | 1 | 4 | 1 | 1 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Phenol | 1 | 3 | 2 | 1 | 1 | 4 |
| Photo solutions | 3 | 4 | ? | 3 | 4 | ? |
| Picric acid | 1 | 2 | 3 | 1 | 2 | 4 |
| Pyridine | 1 | 1 | 4 | 1 | 1 | 1 |

Viton® is a registered trademark of DuPont Dow Elastomers.

**APPENDIX D Hazardous**
**Chemical Receipt Log**

This log is subject to review by college administration, district EH&S, college management, and/or State and Federal officials. The ordering department is responsible for maintaining a MSDS for each hazardous chemical in its inventory and to distribute a copy to the CHO.

| Date of Receipt | Chemical Identity | Quantity | MSDS Submitted to CHO Y/N | Initials |
|---|---|---|---|---|
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# APPENDIX E
## Incident Investigation Report

San Bernardino Valley College

# Incident Investigation Report

Employee's Name: _____

Date of Birth: _/_____/_____ Home Telephone # (_) _____

Home Address: _____

City: _____ State: _____ Zip Code: _____

Present Classification: _____ How long employed at SBVC? _____

Location of accident: _____

Date of accident: _____ Time of accident: _____

Describe fully how accident occurred: (including events that occurred immediately before the accident):

Describe bodily injury sustained (be specific about body part(s) affected):

Recommendation on how to prevent this accident from recurring:

Name of supervisor: _____ Phone: _____

Name(s) of witness(es): _____ Phone: _____

When did you report the injury? _____

Do you require medical attention? Yes: _____ No: _____ Maybe: _____

Name of your treating physician: _____ Phone: _____

Signature of employee: _____ Date: _____

San Bernardino Community College District

Safety Program Approval

Safety Program: **Chemical Hygiene Program – San Bernardino Valley College – 01/22/13 Revision**

Reviewed by: _____ Date 1/22/13

Environmental Health & Safety Administrator

Approved by: _____ Date 2.5.13

SBVC/Vice President Administrative Services/Business Services

Approved by: _____ Date 2/7/13

SBVC President