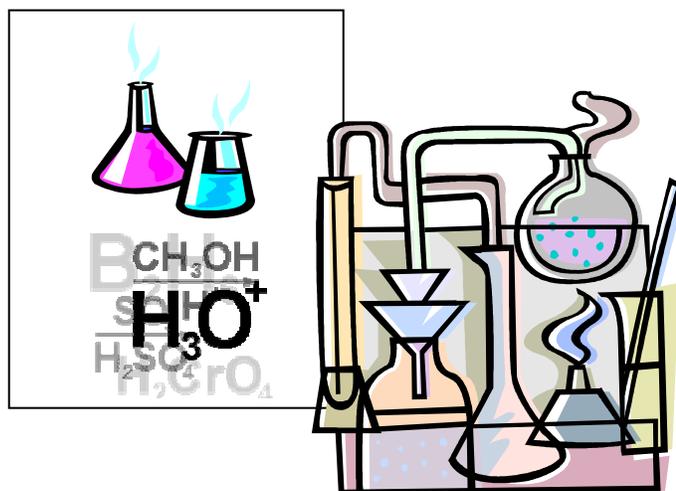


NEW YORK CITY DEPARTMENT OF EDUCATION



CHEMICAL HYGIENE PLAN



**DIVISION OF HUMAN RESOURCES
OFFICE OF OCCUPATIONAL SAFETY AND HEALTH**
Emerson A. Greenidge, M.S., CSP, Director
Revised 9/06

PREFACE

Chemical Hygiene Plan, a revision and update of the previous edition, is a publication of the Office of Occupational Safety and Health. Emerson Greenidge, Director and Carine Jean-Pierre, Research Scientist were responsible for the overall review, organization and production of the revised Plan.

Employees who work in New York City Department of Education school laboratories may handle or encounter chemicals during the course of their normal work duties. Some of these chemicals may be considered hazardous and have the potential, if not handled properly, may pose either health or physical danger.

Under the Occupational Safety and Health Administration's (OSHA's) **Occupational Exposure to Hazardous Chemicals in the Laboratory Standard (29 CFR 1910.1450)**, hazards of all chemicals produced by or imported to Department of Education laboratories are to be evaluated and the information concerning their hazards are to be transmitted to employers and employees. This information is to be transmitted through a comprehensive laboratory safety program, which must include among other things labeling and training requirements, and information on material safety data sheets.

The purpose of this plan is to impart information regarding the aforementioned items to Department of Education employees who may be exposed to hazardous chemicals. This plan will be used as a supplement during Laboratory Safety training sessions and as a resource guide to matters relating to the Department of Education's Chemical Hygiene Program.

CHEMICAL HYGIENE PLAN

Occupational Exposure to Hazardous Chemicals in Laboratories

In accordance with the New York State Department of Labor,
Public Employees Safety and Health (PESH), Occupational Exposure to
Hazardous Chemicals in Laboratories,
29 CFR 1910.1450.

The following Chemical Hygiene Plan has been developed for:

Facility Name:
Address:
Principal Name:
Prepared by the New York City Department of Education Office of Occupational Safety and Health 65 Court Street, Room 706 Brooklyn, New York 11201 (718) 935-2319

**To Be Completed For Each Site and /or Program by the
Chemical Hygiene Officer**

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1.0 FORMAL POLICY STATEMENT

The New York City Department of Education (NYCDOE) is committed to providing a safe and healthful working environment for its employees and believes that they have a right to know the health and safety hazards associated with their work. Pursuant of this objective, the following Chemical Hygiene Plan is provided to reduce or eliminate occupational exposure to hazardous chemicals in school laboratories in conformity with the Federal Government's Office of Occupational Safety and Health (OSHA) Occupational Exposure to Hazardous Chemicals in Laboratories Standard cited as Title 29 Code of Federal Regulations 1910.1450.

1.1 RATIONALE

Many accidents and injuries occur annually in laboratories, resulting in chemical related illnesses ranging from skin burns and eye irritation to pulmonary edema. These warrant serious concerns for workers who have occupational exposure to hazardous chemicals in school laboratories. In recognition of these potential hazards, the New York State Department of Labor, Bureau of Public Employees Safety and Health (PESH) mandates compliance with the Occupational Exposure to Hazardous Chemicals in Laboratories Standard (Appendix A). The primary objective of the standard is to ensure that all employees who work in laboratories are adequately informed about the chemicals they use, the risks involved, and the procedures to follow to minimize their exposure to these chemicals. This regulation comprehensively addresses issues of evaluating and communicating occupational exposure to hazardous chemicals. It includes training, administrative, and engineering requirements that would minimize the likelihood of chemical exposure incidents. It also requires that appropriate procedures are followed in the event that an employee experiences a chemical exposure incident. These requirements maximize the employee's options and abilities to make sound decisions regarding occupational, medical, and other personal lifestyle choices.

1.2 EXECUTIVE SUMMARY

This standard requires employers who have employees with reasonable risk of exposure to hazardous chemicals in laboratories to develop and implement a Chemical Hygiene Program. Its purpose is to establish minimum requirements and procedures for the safety and health of employees who are engaged in the laboratory use of hazardous chemicals in NYCDOE school laboratories. The Chemical Hygiene Plan incorporates policies, procedures, and principles designed to develop employees' awareness of potentially hazardous chemicals in the work place and train them in appropriate, safe working practices. The written plan is the core of the standard and affords flexibility in providing the type of worker protection appropriate for a specific work place. The plan specifies the training and information requirements of the standard. It also establishes appropriate work practices, standard operating procedures, methods of control, measures for appropriate maintenance and use of protective equipment, medical examinations, and special precautions for work with particularly hazardous substances. The employer is

required to evaluate the effectiveness of the written plan at least annually and update it as necessary.

2.0 PROGRAM ADMINISTRATION

2.1 Responsibilities of the Office of Occupational Safety and Health (OOSH)

- **Chemical Hygiene Plan (CHP)** - Develop a written Chemical Hygiene Plan, review the plan annually, and update it as necessary;
- **Training** - Ensure that Regional Health Directors and Chemical Hygiene Officers are adequately trained to effectively comply with the laboratory safety mandate;
- **Training Materials** - Provide appropriate laboratory safety training materials to Regional Health Directors;
- **Training Records** - Maintain records of attendance for employees trained by OOSH;
- **Chemical Exposure Measurements** - On request, conduct indoor air quality (IAQ) monitoring in school laboratories, to determine exposure concentrations;
- **Audit** - Conduct safety audits to ensure that schools with approved laboratories are in compliance with the state mandated regulation;
- **Respiratory Protection Program** - Develop a Respiratory Protection Program if employees are required to use respiratory protective equipment.

2.2 Responsibilities of the Regional Health Director

The **Regional Superintendent** is responsible for the administration of the Chemical Hygiene Program at the sites under his/her supervision. The **Regional Health Director** is designated the responsibility to coordinate safety and health programs for the Regional Superintendent. These responsibilities are as follows:

Table 1 - Designated Regional Health Director

Regional Health Director		
Name	Address	Telephone

- **Chemical Hygiene Plan** - Ensure that the Chemical Hygiene Plan is completed by each school/site and a copy is easily accessible to laboratory employees;
- **Information and Training** - Ensure that each **Chemical Hygiene Officer** receives initial training and that training is conducted at the school level;
- **Recordkeeping** - Maintain training records for three years;
- **Personal Protection** - Monitor each site to ensure that personal protective equipment (PPE) and adequate engineering controls are provided;
- **Compliance Audit** - Ensure that each site complies with the provisions of the Chemical Hygiene Standard. See Appendix B for Laboratory Safety checklist;
- **Medical Consultation, Evaluation, and Follow-up** - (1) Report chemical exposure incidents to the Office of Occupational Safety and Health at (718) 935-2319; (2) Ensure documentation of employee exposure on the appropriate forms (See Appendix C).

2.3 Responsibilities of the Principal

The **Principal** is responsible for the administration of the Laboratory Safety Program at the site. The Principal shall designate a **Chemical Hygiene Officer** (CHO) to ensure that the policies and procedures outlined herein are effectively carried out and to maintain records related to this program. The CHO must be an employee who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan (preferably the Assistant Principal (A.P.) of Science or a senior science teacher).

Table 2 - Designated Chemical Hygiene Officer

Chemical Hygiene Officer		
Name	Room	Telephone

2.3.1 Responsibilities of the Chemical Hygiene Officer

- **Written Chemical Hygiene Plan** - Ensure that the Chemical Hygiene Plan is completed and a copy is readily available to employees, employee representatives, and upon request to OOSH, and PESH compliance officers;
- **Information and Training** - Ensure that each science teacher, laboratory technician, and laboratory specialist with potential occupational exposure to

laboratory chemicals receive initial training and additional training when there is a potential for new exposures;

- **Recordkeeping** - Maintain training records for three years; compile and maintain an inventory of laboratory chemicals and corresponding material safety data sheets (MSDSs);
- **Medical Consultation, Evaluation, and Follow-up** - (1) Report exposure incidents to the Regional Health Director; (2) Document route and circumstances of exposure and, (3) Provide the exposed employee with appropriate forms (See Appendix C);
- **Compliance Inspections** - Ensure that the Chemical Hygiene Plan and training records are readily available to PESH enforcement officers and to Safety and Health personnel from OOSH;
- **Personal Protection** - Ensure that personal protective equipment and adequate engineering controls are provided and proper protocols outlined in the CHP are followed;
- **Compliance Audit** - Complete annually the Laboratory Safety checklist and submit a copy to the Regional Health Director.

2.4 Responsibilities of Division of School Facilities

- **Hazardous Chemical Removal** - Coordinate a hazardous chemical removal program to ensure that hazardous chemicals are identified and removed from NYCDOE facilities.

2.5 Responsibilities of the Employee:

Laboratory employees are responsible for:

- Planning and conducting each experiment or operation in accordance with chemical hygiene procedures and developing good personal chemical hygiene habits;
- **Participating** in laboratory safety-related training programs so that they are aware of chemical hazards and proper chemical use procedures;
- Reporting potential health or safety hazards to their supervisor or chemical hygiene officer so that appropriate corrective action can be taken;
- Proper handling, storage, and labeling of chemicals.

3.0 CHEMICAL EXPOSURE DETERMINATION

Department of Education employees affected by this standard are categorized according to their potential for chemical exposure. Employees who are reasonably anticipated to incur an occupational exposure to hazardous chemicals in school laboratories will:

- a) Receive laboratory safety training;
- b) Be provided with personal protective equipment.

Job classifications and associated tasks in which occupational exposure to hazardous chemicals may occur include the following:

Table 3 - Employees with Potential Occupational Exposure

Employees with Potential Occupational Exposure	
Job Classification	Task(s) with Potential Exposure
Science Teachers	Laboratory experiments
Laboratory Specialists	Pouring and mixing chemicals
Laboratory Technicians	Pouring and mixing chemicals
Other: _____	Other: _____

3.1 **Chemical Exposure Determination a Continuous Process**

At the beginning of each semester, the Principal will be responsible for identifying staff members who are reasonably anticipated to incur occupational exposure to hazardous chemicals in school laboratories. These employees include:

- New employees who will be routinely exposed to hazardous chemicals in the school laboratory;
- **Employees** who originally did not fall into the chemical exposure category, whose job functions have since changed, putting them at occupational risk.

4.0 INFORMATION AND TRAINING

Education and training should be considered the first line of defense in preventing exposure to hazardous chemicals in school laboratories. Laboratory employees will be provided with information and training to ensure that they are apprised of the hazards of chemicals present in the work place. Such information will be provided at the time of an employee's initial laboratory assignment and prior to assignments involving new exposure situations. Refresher and retraining sessions will be held

periodically, when necessary.

4.1 Laboratory Safety Training Kit

On completion of the Laboratory Safety Training Program, each site will be allocated a Laboratory Safety training kit for use in training activities at the school level.

The training kit will contain the following elements:

- A Chemical Hygiene Plan, which includes a copy of the Occupational Exposure to Hazardous Chemicals in Laboratories Standard - 29 CFR 1910.1450;
- Education Protocol for Laboratory Safety and Training Program;
- Laboratory Safety course handouts;
- A Laboratory Safety Fact Sheet;
- A Laboratory Safety Poster; and
- A Chemical Inventory Form

The Chemical Hygiene Officer shall be responsible for the training kit, which shall be kept at the following location:

Table 4 - Laboratory Safety Training Kit

Location of the Laboratory Safety Training Kit			
Building	Floor	Room	Responsible Person

4.2 A. TRAINING OBJECTIVES

Upon completion of the Laboratory Safety Training Program, the employee will:

- Be aware of the Occupational Exposure to Hazardous Chemicals in the Laboratory Standard and its requirements.
- Know the Chemical Hygiene Officer for their site.
- Know the location for the Chemical Hygiene Plan, chemical inventory sheets and Material Safety Data Sheets (MSDSs) or fact sheets for hazardous chemicals

used, stored or produced in the laboratory.

- Know how to read and understand chemical labels and MSDSs.
- Know the toxicology of hazardous chemicals and possible routes of exposure.
- Know how to identify the physical and health hazards of chemicals in his/her work area and the signs and symptoms related to exposure to hazardous chemicals.
- Be knowledgeable of procedures regarding the safe handling, storage and disposal of hazardous chemicals.
- Be aware of monitoring protocols, medical consultation procedures, emergency procedures, and clean up protocols in the event of exposure to hazardous chemicals.
- Be able to identify the appropriate protective equipment for the area they work in and demonstrate its use.

B. TRAINING TOPICS

Topics to be covered:

1. **Content of the Laboratory Standard**
2. **Location of the Chemical Hygiene Plan**
3. **Identification of Hazardous Chemicals**
 - a. Physical and chemical nature of laboratory chemicals
 - b. Location of chemical inventory
 - c. Location of MSDS
 - i. Obtaining a copy
 - ii. Location in workplace
4. **Toxicology**
 - a. Routes of exposure and target organs
 - b. Carcinogen warnings
 - c. Signs and symptoms associated with overexposure to laboratory chemicals
 - d. Location of Target Organ Poster (Appendix D)

5. **Written procedures for handling hazardous chemicals**
 - a. Work practices
 - b. Proper moving, storing, and use
 - c. PEL (Permissible Exposure Levels) for specific chemicals used by the employee
 - d. Visual appearance of chemicals used by the employee
 - e. Environmental monitoring required
 - f. Protective equipment used to prevent overexposure
 - g. Conditions to avoid

6. **Environmental protection**
 - a. Emergency procedures
 - b. Spill containment (Think C.L.E.A.N. protocol)
 - c. Medical consultation procedures
 - d. Documentation of initial and periodic training

4.3 Training Records

An Employee Attendance Record (see Appendix E) shall be maintained by the Chemical Hygiene Officer. These training records must be kept on site for three (3) years from the date of training.

Table 5 - Location of Chemical Hygiene Training Records

Location of Chemical Hygiene Training Records		
Person Responsible	Room No.	Telephone Number

5.0 CHEMICAL EXPOSURE CONTROLS

Hazardous chemicals can cause harm when they enter the body in sufficient amounts via dermal absorption/penetration, inhalation, ingestion, or mucus membrane penetration. The chemical and physical characteristics of the hazardous substances as well as the route(s) of entry into the body determine the types of exposure controls which are needed. PESH and other professional organizations

have established occupational exposure limits on airborne chemical exposure. Keeping exposures below these limits is generally believed to protect employees. Still, all employees should take precautions to minimize exposure to hazardous chemicals. Three methods are used to limit chemical exposure:

- Engineering Controls
- Administrative Controls
- Personal Protective Equipment (PPE).

5.1 Engineering Controls

Whenever possible, substitution of less hazardous chemicals should be used as a primary method of preventing adverse effects due to chemical exposure. Properly exhausted laboratory fume hoods, glove boxes, or other means of control must be used when there is a likelihood of excessive employee exposure to air contaminants generated by laboratory activities. Used in combination with good laboratory work procedures, a properly designed, operated and maintained exhaust ventilation device is effective in minimizing employee exposure to airborne contaminants. A hood should be used for operations that might result in release of toxic chemical vapors, gas or dust. "As a general rule, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm." Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made. Keep materials stored in hoods to a minimum, and do not allow materials to block vents or air flow. Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off". **Fume hoods should be periodically inspected by the Chemical Hygiene Officer (CHO) to ensure proper and adequate performance.** If fume hoods are found not to be functioning properly, the CHO should contact the Office of Occupational Safety and Health regarding the non-functioning fume hood(s).

Fire extinguishers made available for employee use are to be visually inspected, at least monthly. These extinguishers must be subjected to an annual maintenance check and must be tagged. All chemical storerooms should be adequately ventilated. Ventilated storage cabinets for chemicals shall be provided as needed throughout the laboratory.

5.2 Administrative Controls

Most laboratory chemicals are potentially hazardous and precautionary methods must be instituted to minimize exposure during handling. Employees are to assume that any mixture of hazardous chemicals is more toxic than its most toxic component. Employees must observe the following safety and health guidelines when working in the laboratory:

- a. Do not smell or taste chemicals. Apparatus should be vented into local exhaust devices.
- b. Do not eat, drink, smoke, chew gum or apply cosmetics or lip balm in areas where laboratory chemicals are present. Wash hands before conducting these activities.
- c. Do not store, handle or consume food or beverages in laboratories or work areas.
- d. Do not store food or beverages in refrigerators, glassware or utensils that are used for laboratory operations.
- e. Wear appropriate gloves when the potential for contact with toxic materials exists. Inspect gloves before use
- f. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flask and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.
- g. Wash hands or other exposed area thoroughly before leaving the laboratory.
- h. Discard gloves and remove laboratory coat before leaving the laboratory.
- i. Avoid practical jokes or other behavior that might confuse, startle, or distract another worker.
- j. Do not use mouth suction for pipetting or starting a siphon.
- k. Confine long hair and loose clothing.
- l. Wear shoes at all times in the laboratory. Do not wear sandals, perforated shoes, or any shoes made of cloth.
- m. Keep the work area clean and uncluttered. Clean up the work area upon completion of an operation.
- n. Ensure that appropriate eye protection is worn by all persons, including visitors, in areas where chemicals are stored or handled.
- o. Use protective and emergency apparel and equipment as appropriate.
- p. Avoid wearing contact lenses in the laboratory, unless necessary. If they are worn, inform the supervisor so that special precautions can be taken in the event of an accident.
- q. **All chemical containers must be properly labeled and stored.**

- r. Seek information and advice about hazards from the Chemical Hygiene Officer or supervisor; plan appropriate protective procedures and positioning of equipment before beginning any new operation.
- s. Report all unsafe conditions to your supervisor or Chemical Hygiene Officer.
- t. Add strong acids and bases slowly to water. (Do not add water to strong acids as it may boil and splash).

In case of accidents and spills, employees are directed to:

- a. **Eye contact:** promptly flush eyes with water for a prolonged period (**15 minutes**) and seek medical attention.
- b. **Ingestion:** encourage the victim to drink large amounts of water.
- c. **Skin contact:** promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention.
- d. **Clean-up:** promptly clean up spills, using appropriate protective apparel and equipment. Ensure proper disposal of hazardous materials. In the case of major spills immediately contact the laboratory supervisor, Chemical Hygiene Officer or principal.

5.3 Personal Protective Equipment

The use of personal protective equipment is necessary when feasible engineering and administrative controls are unavailable or if there is a need to supplement those controls. PPE is used in the following areas to minimize inhalation and physical contact exposures:

- **Hand and feet protection:** Employees are required to wear the appropriate gloves when the employee has the potential for direct skin contact with hazardous chemicals, blood, and infectious materials. Check charts for breakthrough time, permeation rate (“none detected” is ideal), comfort, dexterity, and heat resistance. Foot coverage must be complete (open-toed shoes are not permitted).
- **Eye and face protection:** Employees must wear eye protection whenever chemicals are handled, glassware is used, flames are involved, or when there is a danger of splattering of liquids.
- **Protective clothing:** Employee must wear disposable or no disposable laboratory coats or aprons.

- **Respiratory protection:** Where the use of respirators is necessary to reduce exposure, the respirators shall only be selected and used in accordance with the requirements of 29 CFR 1910.134. Respirator users must be properly trained on the proper use of the respirator to which they have been assigned. The Office of Occupational Safety and Health administers the respiratory protection program.

Ensuring Protective Equipment Performance

To protect the health and safety of laboratory employees, the mechanical ventilation system, fume hoods, eyewash fountains, drench showers, and other protective equipment must function properly at all times. Once these items are installed, they must be inspected and evaluated at least annually to ensure adequate performance.

Eyewash fountains and drench showers should be tested regularly. American National Standards Institute (ANSI) standard Z35.8.1-1990, *Emergency Eyewash and Shower Equipment* offers useful guidelines for eyewash fountains and drench showers. Respirators (if needed) and gloves should be inspected visually before being used.

The general dilution ventilation (heating, ventilating, and air-conditioning [HVAC]) system should be inspected and evaluated regularly to ensure that it provides adequate amounts of outdoor air to laboratory work areas. Properly designed and operated fume hoods are critical to laboratory employee protection. Fume hoods should be fitted with a manometer, other pressure-measuring device, or an airflow-measuring device to enable the laboratory worker to determine whether the hood is operating properly. All fume hoods should be periodically inspected by the Chemical Hygiene Officer and/or OOSH. Laboratory ventilation systems and their evaluation and testing should conform, as much as possible, to applicable standards (e.g., the ANSI/AIHA Z9.5-1992 *Standard for Laboratory Ventilation* and ANSI/ASHRAE 110-1985, *Method of Testing Performance of Laboratory Fume Hoods*). For more information, check the reference sources cited on page 19.

6.0 CHEMICAL INVENTORY

Supervisors are responsible for maintaining an inventory of all hazardous chemicals in the laboratory. An inventory of all chemicals within the laboratory should be performed annually, listing all the chemicals in the laboratory. Special consideration should be shown to those chemicals classified as hazardous by the Department of Transportation (DOT), the Environmental Protection Agency (EPA), or displaying a 2 or greater number in any section of the National Fire Protection Association (NFPA) diamond. DOT and EPA classifications are listed in Appendices F and G.

Chemicals should be listed alphabetically by location according to the most commonly used name (e.g. bleach). The average quantity in storage on a monthly basis, as well as the physical state (e.g., solid, liquid, gas), of each chemical should

be included. The NFPA hazard classification, if known, should be listed along with the manufacturer's name and complete address. A comment should be provided to further identify the chemical's exact location (e.g., under the sink, third shelf in the safety cabinet, etc). Instructions on how to complete the chemical inventory and a chemical inventory form are provided in Appendices H, H-1 and H-2.

Table 6 - Location of Chemical Inventory

Location of Chemical Inventory			
Building	Floor	Room	Responsible Person

6.1 Material Safety Data Sheets (MSDSs)

A Material Safety Data Sheet (MSDS) is a document that describes the chemical and physical characteristics of hazardous chemicals, provides information about safety and health hazards associated with its use, and list the means for controlling those hazards. **Each chemical in the laboratory must have a corresponding MSDS.** Request letters should be sent to manufacturers, if MSDSs are missing. (See Appendix I for a sample request letter).

Alphabetically listed Material Safety Data Sheets should be kept in each laboratory section along with a chemical inventory for the section. The laboratory relies on the chemical manufacturer's information to ascertain whether or not the chemical is hazardous. A sample MSDS is provided in Appendix J.

Table 7 - Location of Material Safety Data Sheets (MSDSs)

Location of Material Safety Data Sheets (MSDSs)			
Building	Floor	Room	Responsible Person

6.2 Chemical Storage

Only sufficient chemicals for immediate use should be on exposed bench tops or in hoods. Quantities sufficient for one day's operation may be kept in the laboratories.

Flammable liquids must not exceed 15 gallons. Other stocks, which should be kept to minimal practical levels, are to be stored in appropriately protected areas of the Central Stock Room.

Chemical storage should be kept as small as practical. Ventilated cabinets and specially monitored refrigerators must be used for chemical storage only. No food is permitted in these refrigerators. Flammable liquids should be stored in flammable storage cabinets with self-closing doors and proper ventilation according to NFPA standards. Safety cans with a spring loaded spout are to be used for transporting flammable liquids. Acids and alkalis must be stored on impervious trays, kept below eye level, and separated from one another and from flammables.

Cylinders of compressed gases must be strapped or chained to a wall or bench top and capped when not in use. Empty cylinders must be capped, labeled "empty" and stored separately from full cylinders. Flammable gases must be stored separately from nonflammable gases.

6.3 Labeling

1. All hazardous chemicals that are used in the laboratory or shipped elsewhere must be labeled. Labels affixed to chemicals received from chemical manufacturers, importers, or distributors must contain the following information:
 - a. Identity of the hazardous chemical
 - b. Appropriate hazard warnings
 - c. Name and address of the chemical company (i.e., manufacturer).

2. When hazardous chemicals are transferred from the original container to another container that container must be labeled with the following information:
 - a. Identity of the hazardous chemical
 - b. Route of entry (e.g., eyes, nose, mouth, skin)
 - c. Health hazard
 - d. Physical hazard
 - e. Target organ affected.

An example of a laboratory-generated label is shown below:

ACETIC ACID, 50%
ACETIC ACID
CAS# _____
Route of Entry: Eyes, Skin, Nose
Health Hazard: Poison
Physical Hazard: Corrosive
Target Organ: Skin and Lungs

7.0 WASTE REMOVAL

To assure minimal harm to people, other organisms, and the environment, all disposal of hazardous chemicals must be done in accordance with Federal, State and local guidelines. Only those chemicals reasonably soluble in water are suitable for drain disposal. A compound is considered water soluble if it dissolves to the extent of a least 3%. These compounds are flushed with at least 100 volumes of excess water.

Some exceptions should be noted:

- Organics with boiling points less than 50°C.
- Hydrocarbons, halogenated hydrocarbons, nitrocompounds, mercaptans, and most oxygenated compounds that contain more than five carbon atoms (e.g., Freon).
- Organics that are explosives such as azides and peroxides.
- Concentrated acids or bases.
- Highly toxic, malodorous or lachrymatory substances.
- Steam or waste above 150°F.
- Glass, coffee grounds, wax, paints.

Indiscriminate disposal by pouring waste chemicals down the drain or adding them to mixed refuse for landfill burial is unacceptable. Hoods are not to be used as a means of disposal for volatile chemicals. Disposal by recycling or chemical decontamination should be used when possible.

Waste should be removed from laboratories periodically. The laboratory should store its hazardous waste in areas where it is generated until picked up by a

licensed contractor. After the Custodian has completed a work order for the removal of hazardous waste, he/she should contact **Division of School Facilities, Hazardous Waste Unit**, at (718) 361-3801 regarding this request.

8.0 CHEMICAL SPILLS

Chemical spills will be contained using the Think C.L.E.A.N. Plan:

C- Contain the spill

L- Leave the area

E- Emergency - eye wash, shower, medical care

A- Access MSDS

N- Notify a supervisor

In case of a large spill or emergency, the employee should follow the School's Safety Plan and the Site Safety Officer should notify the Office of Occupational Safety and Health.

9.0 MEDICAL CONSULTATIONS AND EXAMINATION

Medical evaluation will be provided to laboratory employees when any of the following conditions are met:

- The employee develops signs or symptoms associated with a hazardous chemical in the laboratory;
- Exposure monitoring reveals consistent employee exposure greater than the action level for a chemical;
- Whenever a leak, spill, explosion, or other occurrence of a hazardous chemical results in exposure of the employee.

9.1 Post-Exposure Evaluation and Follow-Up After a Chemical Exposure Incident

An employee who experiences a chemical exposure incident will be offered a confidential post-exposure evaluation and follow-up in accordance with the Occupational Exposure to Hazardous Chemicals in Laboratories Standard. All exposure incidents shall be reported, investigated and documented using the following steps.

All employees needing medical attention are to contact the principal and school nurse, if available. If it is an emergency, call 911 for ambulance service.

The Chemical Hygiene Officer shall provide the following information to the physician:

- a. 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 date (if available)
- c. A description of the signs and symptoms of exposure
- d. A copy of the MSDS for the chemical(s) involved.

The physician will provide a written opinion and any recommendation for further medical follow-up. When an employee is injured, the New York State Department of Labor's Log of Work Related Injuries and Illnesses (SH 900) and related forms must be completed, as applicable, for the employee by the Principal or the Principal's designee.

9.2 A Step-By-Step Approach - Exposure Incident

When an employee suffers a chemical exposure incident, the following steps shall be taken:

STEP 1: Employee shall immediately notify the Chemical Hygiene Officer or designee, e.g., school nurse.

STEP 2: Chemical Hygiene Officer or designee shall immediately report incident by telephone to:

Office of Occupational Safety and Health

65 Court Street - Room 706

Brooklyn, NY 11201

Phone: (718) 935 - 2319

Fax: (718) 935 - 4682.

A copy of the report must be submitted to the Office of Occupational Safety and Health within **48 hours**.

The Chemical Hygiene Officer or designee shall document the route and circumstances of exposure. All exposure incidents that result in lost time or doctor's visit must be documented through appropriate workers' compensation procedures and on the SH 900, SH 900.1 and SH 900.2 forms.

STEP 3: The Chemical Hygiene Officer or designee shall provide employee

with an Employee Exposure Incident Report and an Employee Exposure Follow-up Record. See Appendix C.

STEP 4: The employee should seek medical evaluation, treatment and counseling from his/her private physician or health care provider. The private physician or health care provider will provide medical evaluation and counseling based on the following information:

- A written description of the exposed employee's duties as they relate to the exposure incident;
- Wrote documentation of the route of exposure and circumstances under which exposure occurred.

9.3 Claims

If employee is occupationally exposed to chemicals and incurs medical expenses as a result of seeking medical attention for this exposure, the employer will reimburse these expenses if such medical services are required according to OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories Standard. In addition, if stipulated by the Standard, the employer will allow time for any required medical procedures stemming from job related exposure. Claims must be submitted to the Claims unit of the Medical Bureau of the Division of Human Resources.

Required Enclosures:

- Proof of payment, i.e., either copy of canceled checks or copy of receipted paid bill on the doctor's or vendor letterhead;
- Detailed bills that reflect the nature of the medical services rendered;
- Bills must reflect the CPT code for the services rendered;
- Notices of reimbursement from GHI, Medicare and private health insurance plans. GHI-CBP subscribers using participating physicians should include copy of the reimbursement notices sent to their doctors by GHI.

Copies of the requisite claim forms can be obtained from the Claims Unit of the Medical Bureau, phone (718) 935-2742.

Mail forms and enclosures to: **The New York City Department of Education
Division of Human Resources
Claims Unit - Medical Bureau**

65 Court Street- Room 209

Brooklyn, New York 11201

Phone: (718) 935-2742

9.4 Record Keeping

9.4.1 Medical Records

The Department of Education is responsible for storing and maintaining medical records related to occupational exposure. Medical records shall be maintained in accordance with 29 CFR 1910. 20. These records shall be kept confidential, and not disclosed without the employee's written consent. **A copy of the post exposure evaluation and follow up must be submitted through the Chemical Hygiene Officer to the Office of Occupational Safety and Health.** Medical records must be maintained for at least *the duration of employment plus 30 years*. The records shall include the following:

- Name and social security number of the employee;
- A copy of all results of examination, medical testing and follow-up procedures;
- A copy of the information provided by the health care professional, including a description of the employee's duties as they relate to the exposure incident, and documentation of the routes of exposure;
- Confidential copy of the health care professional's opinion.

9.4.2 Training Records

The Chemical Hygiene Officer, Regional Health Director and the Office of Occupational Safety and Health are responsible for maintaining training records. Training records are to be kept on site for three years from the date of training and must include the following information:

- Dates of training sessions;
- An outline describing material presented;
- The names and qualifications of persons conducting training;
- The names and job titles of all persons attending the training sessions.

9.4.3 Availability of Records

An employee's medical records shall be provided upon request from the Department of Education for examination and copying to the employee, to anyone having written

consent of the employee, to PESH and representatives from the National Institute of Occupational Safety and Health (NIOSH). An employee's training records shall be made available to the employee, his designated representative, Office of Occupational Safety and Health, PESH and NIOSH.

10.0 CUSTODIAL SERVICE

Custodial staff should clean floors regularly. All custodial employees should be apprised of the hazards associated with work in the laboratory. The Chemical Hygiene Officer or the Site Safety Officer should relay this information to the Custodian.

REFERENCES

The following references were used to assist in the preparation of this plan:

1. US Department of Labor, final rule part II. Federal Register 29 CFR Part 1910. Occupational Exposure to Hazardous Chemicals in Laboratories, Wednesday, January 31, 1990.
2. National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, 1981.
3. National Research Council. Prudent Practices of Disposal of Chemicals from Laboratories, National Academy Press, 1983.
4. Laboratory Chemical Hygiene: An AIHA Protocol Guide, AIHA Publication, 1995.
5. Science Safety Manual, New York City Department of Education, 1997.

GLOSSARY

The following terms are used as part of the Chemical Hygiene Program:

ACGIH - American Conference of Governmental Industrial Hygienists. A group of independent industrial hygienists who periodically reviews the effectiveness of OSHA's PELs.

ACUTE - Health effects which show up a short length of time after exposure. An acute exposure runs a short course.

AHERA - Asbestos Hazard Emergency Response Act of 1986.

CARCINOGEN - A substance capable of causing cancer.

CHEMICAL AGENTS - A wide variety of materials, some of which, have a high potential for body entry. Some are toxic and require special measures of control for safety and environmental protection.

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.

CHRONIC - An adverse effect and/or symptoms that develops or recurs slowly over a long period of time. A chronic exposure is prolonged, persistent or repeated.

COMBUSTIBLE - Able to catch on fire and burn.

DOT - Department of Transportation.

EPA - Environmental Protection Agency.

EXTREMELY HAZARDOUS SUBSTANCE - Acute toxin with exposure level less than 2 ppm or 2 mg/m³, carcinogens, reproductive toxins.

FLAMMABLE - Capable of being easily ignited.

HAZARDOUS CHEMICALS - Any chemical which is a health hazard.

INFECTIOUS AGENTS - Sources that cause infections either by inhalation, ingestion, or direct contact.

LABORATORY SCALE - Work with chemicals that can easily and safely be manipulated by one person.

LABORATORY USE - For use where relatively small quantities of hazardous chemicals are employed on a non-production basis.

LC 50 - The concentration of a substance that causes death in 50% of the animal exposed by inhalation. A measure of acute toxicity.

LD 50 - The dose that causes death in 50% of exposed animals. A measure of acute toxicity.

MSDS - Material Safety Data Sheet.

MUTAGEN - A substance capable of changing cells in such a way that future cell generations are affected. Mutagenic substances are suspect carcinogens.

OSHA - Occupational Safety and Health Administration. The branch of the Department of Labor which is concerned with employee safety and health.

PEL - Permissible Exposure Limit. An exposure limit that is published and enforced by OSHA as a legal standard.

pH - A measure of how acid or alkaline a substance is on a scale of 1 (very acid) to 14 (very basic).

PHYSICAL AGENTS - Workplace sources recognized for their potential effects on the body. Heat exposure or excessive noise levels are examples.

SENSITIZERS - Agents which cause an allergic reaction.

STERILITY - Changes in reproductive systems resulting in an ability to reproduce.

TERATOGENS - Substances that cause deformity to the fetus during pregnancy.

TLV - Threshold Limit Value. The amount of exposure to a contaminant allowable for an employee in an 8-hour workday or 40-hour work week.

APPENDICES SECTION

APPENDIX A

**OCCUPATIONAL EXPOSURE TO HAZARDOUS CHEMICALS IN LABORATORIES -
29 CFR 1910.1450**

**APPENDIX A TO §1910.1450 —NATIONAL RESEARCH COUNCIL
RECOMMENDATIONS CONCERNING CHEMICAL HYGIENE IN LABORATORIES
(NON-MANDATORY)**

APPENDIX B TO §1910.1450—REFERENCES (NON-MANDATORY)

Regulations (Standards - 29 CFR)

Occupational exposure to hazardous chemicals in laboratories. - 1910.1450

◀ Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1910
 - **Part Title:** Occupational Safety and Health Standards
 - **Subpart:** Z
 - **Subpart Title:** Toxic and Hazardous Substances
 - **Standard Number:** 1910.1450
 - **Title:** Occupational exposure to hazardous chemicals in laboratories.

 - **Appendix:** A , B
-

1910.1450(a)

Scope and application.

1910.1450(a)(1)

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

1910.1450(a)(2)

Where this section applies, it shall supersede, for laboratories, the requirements of all other OSHA health standards in 29 CFR part 1910, subpart Z, except as follows:

1910.1450(a)(2)(i)

For any OSHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit shall apply for laboratories, unless that particular standard states otherwise or unless the conditions of paragraph (a)(2)(iii) of this section apply.

1910.1450(a)(2)(ii)

Prohibition of eye and skin contact where specified by any OSHA health standard shall be observed.

1910.1450(a)(2)(iii)

Where the action level (or in the absence of an action level, the permissible exposure limit) is routinely exceeded for an OSHA regulated substance with exposure monitoring and medical surveillance requirements paragraphs (d) and (g)(1)(ii) of this section shall apply.

1910.1450(a)(3)

This section shall not apply to:

1910.1450(a)(3)(i)

Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant standard in 29 CFR part 1910, subpart Z, even if such use occurs in a laboratory.

1910.1450(a)(3)(ii)

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

1910.1450(a)(3)(ii)(A)

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

1910.1450(a)(3)(ii)(B)

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.

1910.1450(b)

Definitions --

Action level means a concentration designated in 29 CFR part 1910 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.

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

Carcinogen (see select carcinogen).

Chemical Hygiene Officer means 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 means a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meets the requirements of paragraph (e) of this section.

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

Compressed gas means:

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

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

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

Designated area means 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 means 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 means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

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

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

(i) **Aerosol, flammable** means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame protection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) **Gas, flammable** means:

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

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

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

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

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

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 - 1979 (ASTM D 56-79)) - for liquids with a

viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg. F (37.8 deg. C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

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

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

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

Hazardous chemical means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Appendices A and B of the Hazard Communication Standard (29 CFR 1910.1200) 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 standard.

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

Laboratory-type hood means a device located in a laboratory, enclosure on five sides with a movable sash or fixed partial enclosed 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 means handling or use of such chemicals in

which all of the following conditions are met:

- (i) Chemical manipulations are carried out on a "laboratory scale;"
- (ii) Multiple chemical procedures or chemicals are used;
- (iii) The procedures involved are not part of a production process, nor in any way simulate a production process; and
- (iv) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

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

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

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

Protective laboratory practices and equipment means 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 means chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select carcinogen means any substance which meets one of the following criteria:

- (i) It is regulated by OSHA as a carcinogen; or
- (ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP)(latest edition); or
- (iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for research on Cancer Monographs (IARC)(latest editions); or
- (iv) 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) means 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 means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

1910.1450(c)

Permissible exposure limits. For laboratory uses of OSHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in 29 CFR part 1910, subpart Z.

1910.1450(d)

Employee exposure determination --

1910.1450(d)(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 routinely exceed the action level (or in the absence of an action level, the PEL).

1910.1450(d)(2)

Periodic monitoring. If the initial monitoring prescribed by paragraph (d)(1) of this section discloses employee exposure over the action level (or in the absence of an action level, the PEL), the employer shall immediately comply with the exposure monitoring provisions of the relevant standard.

1910.1450(d)(3)

Termination of monitoring. Monitoring may be terminated in accordance with the relevant standard.

1910.1450(d)(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.

1910.1450(e)

Chemical hygiene plan -- General. (Appendix A of this section is non-mandatory but provides guidance to assist employers in the development of the Chemical Hygiene Plan).

1910.1450(e)(1)

Where hazardous chemicals as defined by this standard are used in the workplace, the

employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

1910.1450(e)(1)(i)

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

1910.1450(e)(1)(ii)

Capable of keeping exposures below the limits specified in paragraph (c) of this section.

1910.1450(e)(2)

The Chemical Hygiene Plan shall be readily available to employees, employee representatives and, upon request, to the Assistant Secretary.

1910.1450(e)(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;

1910.1450(e)(3)(i)

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

1910.1450(e)(3)(ii)

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;

1910.1450(e)(3)(iii)

A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment;

1910.1450(e)(3)(iv)

Provisions for employee information and training as prescribed in paragraph (f) of this section;

1910.1450(e)(3)(v)

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;

1910.1450(e)(3)(vi)

Provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section;

1910.1450(e)(3)(vii)

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

1910.1450(e)(3)(viii)

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:

1910.1450(e)(3)(viii)(A)

Establishment of a designated area;

1910.1450(e)(3)(viii)(B)

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

1910.1450(e)(3)(viii)(C)

Procedures for safe removal of contaminated waste; and

1910.1450(e)(3)(viii)(D)

Decontamination procedures.

1910.1450(e)(4)

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

1910.1450(f)

Employee information and training.

1910.1450(f)(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.

1910.1450(f)(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.

1910.1450(f)(3)

Information. Employees shall be informed of:

1910.1450(f)(3)(i)

The contents of this standard and its appendices which shall be made available to employees;

1910.1450(f)(3)(ii)

the location and availability of the employer's Chemical Hygiene Plan;

1910.1450(f)(3)(iii)

The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;

1910.1450(f)(3)(iv)

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

1910.1450(f)(3)(v)

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.

1910.1450(f)(4)

Training.

1910.1450(f)(4)(i)

Employee training shall include:

1910.1450(f)(4)(i)(A)

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.);

1910.1450(f)(4)(i)(B)

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

1910.1450(f)(4)(i)(C)

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.

1910.1450(f)(4)(ii)

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

1910.1450(g)

Medical consultation and medical examinations.

1910.1450(g)(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:

1910.1450(g)(1)(i)

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.

1910.1450(g)(1)(ii)

Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an 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.

1910.1450(g)(1)(iii)

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.

1910.1450(g)(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.

1910.1450(g)(3)

Information provided to the physician. The employer shall provide the following information to the physician:

1910.1450(g)(3)(i)

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

1910.1450(g)(3)(ii)

A description of the conditions under which the exposure occurred including

quantitative exposure data, if available; and

1910.1450(g)(3)(iii)

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

1910.1450(g)(4)

Physician's written opinion.

1910.1450(g)(4)(i)

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

1910.1450(g)(4)(i)(A)

Any recommendation for further medical follow-up;

1910.1450(g)(4)(i)(B)

The results of the medical examination and any associated tests;

1910.1450(g)(4)(i)(C)

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 workplace; and

1910.1450(g)(4)(i)(D)

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.

1910.1450(g)(4)(ii)

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

1910.1450(h)

Hazard identification.

1910.1450(h)(1)

With respect to labels and material safety data sheets:

1910.1450(h)(1)(i)

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

1910.1450(h)(1)(ii)

Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

1910.1450(h)(2)

The following provisions shall apply to chemical substances developed in the laboratory:

1910.1450(h)(2)(i)

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 paragraph (b) of this section. If the chemical is determined to be hazardous, the employer shall

provide appropriate training as required under paragraph (f) of this section.

1910.1450(h)(2)(ii)

If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement paragraph (e) of this

section.

1910.1450(h)(2)(iii)

If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (29 CFR 1910.1200) including the requirements for preparation of material safety data sheets and labeling.

1910.1450(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 29 CFR 1910.134.

1910.1450(j)

Recordkeeping.

1910.1450(j)(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 standard.

1910.1450(j)(2)

The employer shall assure that such records are kept, transferred, and made available in accordance with 29 CFR 1910.1020.

1910.1450(k)

[Reserved]

1910.1450(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.

[55 FR 3327, Jan. 31, 1990; 55 FR 7967, March, 6, 1990; 55 FR 12777, March 30, 1990; 61 FR 5507, Feb. 13, 1996; 71 FR 16674, April 3, 2006]

APPENDIX A TO §1910.1450 —NATIONAL RESEARCH COUNCIL RECOMMENDATIONS CONCERNING CHEMICAL HYGIENE IN LABORATORIES (NON-MANDATORY)

Regulations (Standards - 29 CFR)

National Research Council Recommendations Concerning Chemical Hygiene in Laboratories (Non-Mandatory) - 1910.1450 App A

 [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

• Part Number:	1910
• Part Title:	Occupational Safety and Health Standards
• Subpart:	Z
• Subpart Title:	Toxic and Hazardous Substances
• Standard Number:	1910.1450 App A
• Title:	National Research Council Recommendations Concerning Chemical Hygiene in Laboratories (Non-Mandatory)

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Foreword

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2. Avoid Underestimation of Risk
3. Provide Adequate Ventilation
4. Institute a Chemical Hygiene Program
5. Observe the PELs and TLVs

B. Responsibilities

1. Chief Executive Officer
2. Supervisor of Administrative Unit
3. Chemical Hygiene Officer
4. Laboratory Supervisor
5. Project Director
6. Laboratory Worker

C. The Laboratory Facility

1. Design
2. Maintenance
3. Usage
4. Ventilation

D. Components of the Chemical Hygiene Plan

1. Basic Rules and Procedures
2. Chemical Procurement, Distribution, and Storage
3. Environmental Monitoring
4. Housekeeping, Maintenance and Inspections
5. Medical Program
6. Personal Protective Apparel and Equipment

7. Records

8. Signs and Labels

9. Spills and Accidents

10. Training and Information

11. Waste Disposal

E. General Procedures for Working With Chemicals

1. General Rules for all Laboratory Work with Chemicals

2. Allergens and Embryotoxins

3. Chemicals of Moderate Chronic or High Acute Toxicity

4. Chemicals of High Chronic Toxicity

5. Animal Work with Chemicals of High Chronic Toxicity

F. Safety Recommendations

G. Material Safety Data Sheets

Foreword

As guidance for each employer's development of an appropriate laboratory Chemical Hygiene Plan, the following non-mandatory recommendations are provided. They were extracted from "Prudent Practices" for Handling Hazardous Chemicals in Laboratories" (referred to below as "Prudent Practices"), which was published in 1981 by the National Research Council and is available from the National Academy Press, 2101 Constitution Ave., NW, Washington DC 20418.

"Prudent Practices" is cited because of its wide distribution and acceptance and because of its preparation by members of the laboratory community through the sponsorship of the National Research Council. However, none of the recommendations given here will modify any requirements of the laboratory standard. This Appendix merely presents pertinent recommendations from "Prudent Practices", organized into a form convenient for quick reference during operation of a laboratory facility and during development and application of a Chemical Hygiene Plan. Users of this appendix should consult "Prudent Practices" for a more extended presentation and justification for each recommendation.

"Prudent Practices" deal with both safety and chemical hazards while the laboratory standard is concerned primarily with chemical hazards. Therefore, only those recommendations directed primarily toward control of toxic exposures are cited in this appendix, with the term "chemical Hygiene" being substituted for the word "safety". However, since conditions producing or threatening physical injury often pose toxic risks as well, page references concerning major categories of safety hazards in the laboratory are given in section F.

The recommendations from "Prudent Practices" have been paraphrased, combined, or otherwise reorganized, and headings have been added. However, their sense has not been changed.

Corresponding Sections of the Standard and this Appendix

The following table is given for the convenience of those who are developing a Chemical Hygiene Plan which will satisfy the requirements of paragraph (e) of the standard. It indicates those sections of this appendix which are most pertinent to each of the sections of paragraph (e) and related paragraphs.

Paragraph and topic in laboratory standard	Relevant appendix section
(e) (3) (i) Standard operating procedures for handling toxic chemicals.	C, D, E
(e) (3) (ii) Criteria to be used for implementation of measures to reduce exposures.	D
(e) (3) (iii) Fume hood performance	C4b
(e) (3) (iv) Employee information and training (including emergency procedures).	D10, D9
(e) (3) (v) Requirements for prior approval of laboratory activities.	E2b, E4b
(e) (3) (vi) Medical consultation and medical examinations.	D5, E4f
(e) (3) (vii) Chemical hygiene responsibilities.	B
(e) (3) (viii) Special precautions for work with particularly hazardous substances.	E2, E3, E4

In this appendix, those recommendations directed primarily at administrators and supervisors are given in sections A-D. Those recommendations of primary concern to employees who are actually handling laboratory chemicals are given in section E. (Reference to page numbers in "Prudent Practices" are given in parentheses.)

A. General Principles for Work with Laboratory Chemicals

In addition to the more detailed recommendations listed below in sections B-E, "Prudent Practices" expresses certain general principles, including the following:

1. It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals (2,10). Skin contact with chemicals should be avoided as a cardinal rule (198).
2. Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances which present special hazards, special precautions should be taken (10, 37, 38). One should assume that any mixture will be more toxic than its most toxic component (30, 103) and that all substances of unknown toxicity are toxic (3, 34).

3. Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices (32, 198).

4. Institute a chemical hygiene program. A mandatory chemical hygiene program designed to minimize exposures is needed; it should be a regular, continuing effort, not merely a standby or short-term activity (6,11). Its recommendations should be followed in academic teaching laboratories as well as by full-time laboratory workers (13).

5. Observe the PELs, TLVs. The Permissible Exposure Limits of OSHA and the Threshold Limit Values of the American Conference of Governmental Industrial Hygienists should not be exceeded (13).

B. Chemical Hygiene Responsibilities

Responsibility for chemical hygiene rests at all levels (6, 11, 21) including the:

1. Chief executive officer, who has ultimate responsibility for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene (7, 11).

2. Supervisor of the department or other administrative unit, who is responsible for chemical hygiene in that unit (7).

3. chemical hygiene officer(s), whose appointment is essential (7) and who must:

(a) Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices (7);

(b) Monitor procurement, use, and disposal of chemicals used in the lab (8);

(c) See that appropriate audits are maintained (8);

(d) Help project directors develop precautions and adequate facilities (10);

(e) Know the current legal requirements concerning regulated substances (50); and

(f) Seek ways to improve the chemical hygiene program (8, 11).

4. Laboratory supervisor, who has overall responsibility for chemical hygiene in the laboratory (21) including responsibility to:

(a) Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided (21, 22);

(b) Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment (21, 171);

(c) Know the current legal requirements concerning regulated substances (50, 231);

- (d) Determine the required levels of protective apparel and equipment (156, 160, 162); and
- (e) Ensure that facilities and training for use of any material being ordered are adequate (215).

5. Project director or director of other specific operation, who has primary responsibility for chemical hygiene procedures for that operation (7).

6. Laboratory worker, who is responsible for:

(a) Planning and conducting each operation in accordance with the institutional chemical hygiene procedures (7, 21, 22, 230); and

(b) Developing good personal chemical hygiene habits (22).

C. The Laboratory Facility

1. Design. The laboratory facility should have:

(a) An appropriate general ventilation system (see C4 below) with air intakes and exhausts located so as to avoid intake of contaminated air (194);

(b) Adequate, well-ventilated stockrooms/storerooms (218, 219).

(c) Laboratory hoods and sinks (12, 162);

(d) Other safety equipment including eyewash fountains and drench showers (162, 169); and

(e) Arrangements for waste disposal (12, 240).

2. Maintenance. Chemical-hygiene-related equipment (hoods, incinerator, etc.) should undergo continual appraisal and be modified if inadequate (11, 12).

3. Usage. The work conducted (10) and its scale (12) must be appropriate to the physical facilities available and, especially, to the quality of ventilation (13).

4. Ventilation - (a) General laboratory ventilation. This system should: Provide a source of air for breathing and for input to local ventilation devices (199); it should not be relied on for protection from toxic substances released into the laboratory (198); ensure that laboratory air is continually replaced, preventing increase of air concentrations of toxic substances during the working day (194); direct air flow into the laboratory from non-laboratory areas and out to the exterior of the building (194).

(b) Hoods. A laboratory hood with 2.5 linear feet of hood space per person should be provided for every 2 workers if they spend most of their time working with chemicals (199); each hood should have a continuous monitoring device to allow convenient confirmation of adequate hood performance before use (200, 209). If this is not possible, work with substances of unknown toxicity should be avoided (13) or other types of local ventilation devices should be provided (199). See pp. 201-206 for a discussion of hood design, construction, and evaluation.

(c) Other local ventilation devices. Ventilated storage cabinets, canopy hoods, snorkels, etc. should

be provided as needed (199). Each canopy hood and snorkel should have a separate exhaust duct (207).

(d) Special ventilation areas. Exhaust air from glove boxes and isolation rooms should be passed through scrubbers or other treatment before release into the regular exhaust system (208). Cold rooms and warm rooms should have provisions for rapid escape and for escape in the event of electrical failure (209).

(e) Modifications. Any alteration of the ventilation system should be made only if thorough testing indicates that worker protection from airborne toxic substances will continue to be adequate (12, 193, 204).

(f) Performance. Rate: 4-12 room air changes/hour is normally adequate general ventilation if local exhaust systems such as hoods are used as the primary method of control (194).

(g) Quality. General air flow should not be turbulent and should be relatively uniform throughout the laboratory, with no high velocity or static areas (194, 195); airflow into and within the hood should not be excessively turbulent (200); hood face velocity should be adequate (typically 60-100 fpm) (200, 204).

(h) Evaluation. Quality and quantity of ventilation should be evaluated on installation (202), regularly monitored (at least every 3 months) (6, 12, 14, 195), and reevaluated whenever a change in local ventilation devices is made (12, 195, 207). See pp 195-198 for methods of evaluation and for calculation of estimated airborne contaminant concentrations.

D. Components of the Chemical Hygiene Plan

1. Basic Rules and Procedures (Recommendations for these are given in section E, below)

2. Chemical Procurement, Distribution, and Storage

(a) Procurement. Before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved (215, 216). No container should be accepted without an adequate identifying label (216). Preferably, all substances should be received in a central location (216).

(b) Stockrooms/storerooms. Toxic substances should be segregated in a well-identified area with local exhaust ventilation (221). Chemicals which are highly toxic (227) or other chemicals whose containers have been opened should be in unbreakable secondary containers (219). Stored chemicals should be examined periodically (at least annually) for replacement, deterioration, and container integrity (218-19).

Stockrooms/storerooms should not be used as preparation or repackaging areas, should be open during normal working hours, and should be controlled by one person (219).

(c) Distribution. When chemicals are hand carried, the container should be placed in an outside container or bucket. Freight-only elevators should be used if possible (223).

(d) Laboratory storage. Amounts permitted should be as small as practical. Storage on bench tops and in hoods is inadvisable. Exposure to heat or direct sunlight should be avoided. Periodic

inventories should be conducted, with unneeded items being discarded or returned to the storeroom/stockroom (225-6, 229).

3. Environmental Monitoring

Regular instrumental monitoring of airborne concentrations is not usually justified or practical in laboratories but may be appropriate when testing or redesigning hoods or other ventilation devices (12) or when a highly toxic substance is stored or used regularly (e.g., 3 times/week) (13).

4. Housekeeping, Maintenance, and Inspections

(a) Cleaning. Floors should be cleaned regularly (24).

(b) Inspections. Formal housekeeping and chemical hygiene inspections should be held at least quarterly (6, 21) for units which have frequent personnel changes and semiannually for others; informal inspections should be continual (21).

(c) Maintenance. Eye wash fountains should be inspected at intervals of not less than 3 months (6). Respirators for routine use should be inspected periodically by the laboratory supervisor (169). Other safety equipment should be inspected regularly. (e.g., every 3-6 months) (6, 24, 171). Procedures to prevent restarting of out-of-service equipment should be established (25).

(d) Passageways. Stairways and hallways should not be used as storage areas (24). Access to exits, emergency equipment, and utility controls should never be blocked (24).

5. Medical Program

(a) Compliance with regulations. Regular medical surveillance should be established to the extent required by regulations (12).

(b) Routine surveillance. Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult a qualified physician to determine on an individual basis whether a regular schedule of medical surveillance is desirable (11, 50).

(c) First aid. Personnel trained in first aid should be available during working hours and an emergency room with medical personnel should be nearby (173). See pp. 176-178 for description of some emergency first aid procedures.

6. Protective Apparel and Equipment

These should include for each laboratory:

(a) Protective apparel compatible with the required degree of protection for substances being handled (158-161);

(b) An easily accessible drench-type safety shower (162, 169);

(c) An eyewash fountain (162)

(d) A fire extinguisher (162-164);

(e) Respiratory protection (164-9), fire alarm and telephone for emergency use (162) should be available nearby; and

(f) Other items designated by the laboratory supervisor (156, 160).

7. Records

(a) Accident records should be written and retained (174).

(b) Chemical Hygiene Plan records should document that the facilities and precautions were compatible with current knowledge and regulations (7).

(c) Inventory and usage records for high-risk substances should be kept as specified in sections E3e below.

(d) Medical records should be retained by the institution in accordance with the requirements of state and federal regulations (12).

8. Signs and Labels

Prominent signs and labels of the following types should be posted:

(a) Emergency telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers (28);

(b) Identity labels, showing contents of containers (including waste receptacles) and associated hazards (27, 48);

(c) Location signs for safety showers, eyewash stations, other safety and first aid equipment, exits (27) and areas where food and beverage consumption and storage are permitted (24); and

(d) Warnings at areas or equipment where special or unusual hazards exist (27).

9. Spills and Accidents

(a) A written emergency plan should be established and communicated to all personnel; it should include procedures for ventilation failure (200), evacuation, medical care, reporting, and drills (172).

(b) There should be an alarm system to alert people in all parts of the facility including isolation areas such as cold rooms (172).

(c) A spill control policy should be developed and should include consideration of prevention, containment, cleanup, and reporting (175).

(d) All accidents or near accidents should be carefully analyzed with the results distributed to all who might benefit (8, 28).

10. Information and Training Program

(a) Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs (5, 15).

(b) Emergency and Personal Protection Training: Every laboratory worker should know the location and proper use of available protective apparel and equipment (154, 169).

Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures (6).

Such training as well as first aid instruction should be available to (154) and encouraged for (176) everyone who might need it.

(c) Receiving and stockroom/storeroom personnel should know about hazards, handling equipment, protective apparel, and relevant regulations (217).

(d) Frequency of Training: The training and education program should be a regular, continuing activity - not simply an annual presentation (15).

(e) Literature/Consultation: Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources (14).

11. Waste Disposal Program.

(a) Aim: To assure that minimal harm to people, other organisms, and the environment will result from the disposal of waste laboratory chemicals (5).

(b) Content (14, 232, 233, 240): The waste disposal program should specify how waste is to be collected, segregated, stored, and transported and include consideration of what materials can be incinerated. Transport from the institution must be in accordance with DOT regulations (244).

(c) Discarding Chemical Stocks: Unlabeled containers of chemicals and solutions should undergo prompt disposal; if partially used, they should not be opened (24, 27).

Before a worker's employment in the laboratory ends, chemicals for which that person was responsible should be discarded or returned to storage (226).

(d) Frequency of Disposal: Waste should be removed from laboratories to a central waste storage area at least once per week and from the central waste storage area at regular intervals (14).

(e) Method of Disposal: Incineration in an environmentally acceptable manner is the most practical disposal method for combustible laboratory waste (14, 238, 241).

Indiscriminate disposal by pouring waste chemicals down the drain (14, 231, 242) or adding them to mixed refuse for landfill burial is unacceptable (14).

Hoods should not be used as a means of disposal for volatile chemicals (40, 200).

Disposal by recycling (233, 243) or chemical decontamination (40, 230) should be used when possible.

E. Basic Rules and Procedures for Working with Chemicals

The Chemical Hygiene Plan should require that laboratory workers know and follow its rules and procedures. In addition to the procedures of the sub programs mentioned above, these should include the rules listed below.

1. General Rules

The following should be used for essentially all laboratory work with chemicals:

(a) Accidents and spills - Eye Contact: Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention (33, 172).

Ingestion: Encourage the victim to drink large amounts of water (178).

Skin Contact: Promptly flush the affected area with water (33, 172, 178) and remove any contaminated clothing (172, 178). If symptoms persist after washing, seek medical attention (33).

Clean-up. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal (24, 33). See pp. 233-237 for specific clean-up recommendations.

(b) Avoidance of "routine" exposure: Develop and encourage safe habits (23); avoid unnecessary exposure to chemicals by any route (23);

Do not smell or taste chemicals (32). Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices (199).

Inspect gloves (157) and test glove boxes (208) before use.

Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres (209).

(c) Choice of chemicals: Use only those chemicals for which the quality of the available ventilation system is appropriate (13).

(d) Eating, smoking, etc.: Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present (22, 24, 32, 40); wash hands before conducting these activities (23, 24).

Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware or utensils which are also used for laboratory operations (23, 24, 226).

(e) Equipment and glassware: Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware (25). Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur (25). Use equipment only for its designed purpose (23, 26).

(f) Exiting: Wash areas of exposed skin well before leaving the laboratory (23).

(g) Horseplay: Avoid practical jokes or other behavior which might confuse, startle or distract

another worker (23).

(h) Mouth suction: Do not use mouth suction for pipeting or starting a siphon (23, 32).

(i) Personal apparel: Confine long hair and loose clothing (23, 158). Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers (158).

(j) Personal housekeeping: Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day (24).

(k) Personal protection: Assure that appropriate eye protection (154-156) is worn by all persons, including visitors, where chemicals are stored or handled (22, 23, 33, 154).

Wear appropriate gloves when the potential for contact with toxic materials exists (157); inspect the gloves before each use, wash them before removal, and replace them periodically (157). (A table of resistance to chemicals of common glove materials is given p. 159).

Use appropriate (164-168) respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls (164-5), inspecting the respirator before use (169).

Use any other protective and emergency apparel and equipment as appropriate (22, 157-162).

Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken (155).

Remove laboratory coats immediately on significant contamination (161).

(l) Planning: Seek information and advice about hazards (7), plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation (22, 23).

(m) Unattended operations: Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation (27, 128).

(n) Use of hood: Use the hood for operations which might result in release of toxic chemical vapors or dust (198-9).

As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm (13).

Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made (200); keep materials stored in hoods to a minimum and do not allow them to block vents or air flow (200).

Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off" (200).

(o) Vigilance: Be alert to unsafe conditions and see that they are corrected when detected (22).

(p) Waste disposal: Assure that the plan for each laboratory operation includes plans and training for waste disposal (230).

Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the Chemical Hygiene Plan (22, 24).

Do not discharge to the sewer concentrated acids or bases (231); highly toxic, malodorous, or lachrymatory substances (231); or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage or obstruct flow (242).

(q) Working alone: Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous (28).

2. Working with Allergens and Embryotoxins

(a) Allergens (examples: diazomethane, isocyanates, bichromates): Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity (35).

(b) Embryotoxins (34-5) (examples: organomercurials, lead compounds, formamide): If you are a woman of childbearing age, handle these substances only in a hood whose satisfactory performance has been confirmed, using appropriate protective apparel (especially gloves) to prevent skin contact.

Review each use of these materials with the research supervisor and review continuing uses annually or whenever a procedural change is made.

Store these substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

Notify supervisors of all incidents of exposure or spills; consult a qualified physician when appropriate.

3. Work with Chemicals of Moderate Chronic or High Acute Toxicity

Examples: diisopropylfluorophosphate (41), hydrofluoric acid (43), hydrogen cyanide (45).

Supplemental rules to be followed in addition to those mentioned above (Procedure B of "Prudent Practices", pp. 39-41):

(a) Aim: To minimize exposure to these toxic substances by any route using all reasonable precautions (39).

(b) Applicability: These precautions are appropriate for substances with moderate chronic or high acute toxicity used in significant quantities (39).

(c) Location: Use and store these substances only in areas of restricted access with special warning signs (40, 229).

Always use a hood (previously evaluated to confirm adequate performance with a face velocity of

at least 60 linear feet per minute) (40) or other containment device for procedures which may result in the generation of aerosols or vapors containing the substance (39); trap released vapors to prevent their discharge with the hood exhaust (40).

(d) Personal protection: Always avoid skin contact by use of gloves and long sleeves (and other protective apparel as appropriate) (39). Always wash hands and arms immediately after working with these materials (40).

(e) Records: Maintain records of the amounts of these materials on hand, amounts used, and the names of the workers involved (40, 229).

(f) Prevention of spills and accidents: Be prepared for accidents and spills (41).

Assure that at least 2 people are present at all times if a compound in use is highly toxic or of unknown toxicity (39).

Store breakable containers of these substances in chemically resistant trays; also work and mount apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper (40).

If a major spill occurs outside the hood, evacuate the area; assure that cleanup personnel wear suitable protective apparel and equipment (41).

(g) Waste: Thoroughly decontaminate or incinerate contaminated clothing or shoes (41). If possible, chemically decontaminate by chemical conversion (40).

Store contaminated waste in closed, suitably labeled, impervious containers (for liquids, in glass or plastic bottles half-filled with vermiculite) (40).

4. Work with Chemicals of High Chronic Toxicity

(Examples: dimethylmercury and nickel carbonyl (48), benzo-a-pyrene (51), N-nitrosodiethylamine (54), other human carcinogens or substances with high carcinogenic potency in animals (38).)

Further supplemental rules to be followed, in addition to all these mentioned above, for work with substances of known high chronic toxicity (in quantities above a few milligrams to a few grams, depending on the substance) (47). (Procedure A of "Prudent Practices" pp. 47-50).

(a) Access: Conduct all transfers and work with these substances in a "controlled area": a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions (48).

(b) Approvals: Prepare a plan for use and disposal of these materials and obtain the approval of the laboratory supervisor (48).

(c) Non-contamination/Decontamination: Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the hood (49). Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the hood before removing them from the

controlled area (49, 50).

Decontaminate the controlled area before normal work is resumed there (50).

(d) Exiting: On leaving a controlled area, remove any protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck (49).

(e) Housekeeping: Use a wet mop or a vacuum cleaner equipped with a HEPA filter instead of dry sweeping if the toxic substance was a dry powder (50).

(f) Medical surveillance: If using toxicologically significant quantities of such a substance on a regular basis (e.g., 3 times per week), consult a qualified physician concerning desirability of regular medical surveillance (50).

(g) Records: Keep accurate records of the amounts of these substances stored (229) and used, the dates of use, and names of users (48).

(h) Signs and labels: Assure that the controlled area is conspicuously marked with warning and restricted access signs (49) and that all containers of these substances are appropriately labeled with identity and warning labels (48).

(i) Spills: Assure that contingency plans, equipment, and materials to minimize exposures of people and property in case of accident are available (233-4).

(j) Storage: Store containers of these chemicals only in a ventilated, limited access (48, 227, 229) area in appropriately labeled, unbreakable, chemically resistant, secondary containers (48, 229).

(k) Glove boxes: For a negative pressure glove box, ventilation rate must be at least 2 volume changes/hour and pressure at least 0.5 inches of water (48). For a positive pressure glove box, thoroughly check for leaks before each use (49). In either case, trap the exit gases or filter them through a HEPA filter and then release them into the hood (49).

(l) Waste: Use chemical decontamination whenever possible; ensure that containers of contaminated waste (including washings from contaminated flasks) are transferred from the controlled area in a secondary container under the supervision of authorized personnel (49, 50, 233).

5. Animal Work with Chemicals of High Chronic Toxicity

(a) Access: For large scale studies, special facilities with restricted access are preferable (56).

(b) Administration of the toxic substance: When possible, administer the substance by injection or gavage instead of in the diet. If administration is in the diet, use a caging system under negative pressure or under laminar air flow directed toward HEPA filters (56).

(c) Aerosol suppression: Devise procedures which minimize formation and dispersal of contaminated aerosols, including those from food, urine, and feces (e.g., use HEPA filtered vacuum equipment for cleaning, moisten contaminated bedding before removal from the cage, mix diets in closed containers in a hood) (55, 56).

(d) Personal protection: When working in the animal room, wear plastic or rubber gloves, fully buttoned laboratory coat or jumpsuit and, if needed because of incomplete suppression of aerosols, other apparel and equipment (shoe and head coverings, respirator) (56).

(e) Waste disposal: Dispose of contaminated animal tissues and excreta by incineration if the available incinerator can convert the contaminant to non-toxic products (238); otherwise, package the waste appropriately for burial in an EPA-approved site (239).

F. Safety Recommendations

The above recommendations from "Prudent Practices" do not include those which are directed primarily toward prevention of physical injury rather than toxic exposure. However, failure of precautions against injury will often have the secondary effect of causing toxic exposures. Therefore, we list below page references for recommendations concerning some of the major categories of safety hazards which also have implications for chemical hygiene:

1. Corrosive agents: (35-6)
2. Electrically powered laboratory apparatus: (179-92)
3. Fires, explosions: (26, 57-74, 162-64, 174-5, 219-20, 226-7)
4. Low temperature procedures: (26, 88)
5. Pressurized and vacuum operations (including use of compressed gas cylinders): (27, 75-101)

G. Material Safety Data Sheets

Material safety data sheets are presented in "Prudent Practices" for the chemicals listed below. (Asterisks denote that comprehensive material safety data sheets are provided).

- o Acetyl peroxide (105)
- o Acrolein (106)
- o Acrylonitrile
- Ammonia (anhydrous) (91)
- o Aniline (109)
- o Benzene (110)
- o Benzo[a]pyrene (112)
- o Bis(chloromethyl) ether (113)
- Boron trichloride (91)
- Boron trifluoride (92)
- Bromine (114)
- o Tert-butyl hydroperoxide (148)
- o Carbon disulfide (116)
- Carbon monoxide (92)
- o Carbon tetrachloride (118)
- *Chlorine (119)
- Chlorine trifluoride (94)
- o Chloroform (121)
- Chloromethane (93)
- o Diethyl ether (122)
- Diisopropyl fluorophosphate (41)
- o Dimethylformamide (123)
- o Dimethyl sulfate (125)
- o Dioxane (126)
- o Ethylene dibromide (128)
- o Fluorine (95)
- o Formaldehyde (130)
- o Hydrazine and salts (132)

Hydrofluoric acid (43)
Hydrogen bromide (98)
Hydrogen chloride (98)
o Hydrogen cyanide (133)
o Hydrogen sulfide (135)
Mercury and compounds (52)
o Methanol (137)
o Morpholine (138)
o Nickel carbonyl (99)
o Nitrobenzene (139)
Nitrogen dioxide (100)
N-nitrosodiethylamine (54)
o Peracetic acid (141)
o Phenol (142)
o Phosgene (143)
o Pyridine (144)
o Sodium azide (145)
o Sodium cyanide (147)
Sulfur dioxide (101)
o Trichloroethylene (149)
o Vinyl chloride (150)

APPENDIX B TO §1910.1450—REFERENCES (NON-MANDATORY)

Regulations (Standards - 29 CFR)

References (Non-Mandatory) - 1910.1450 App B

 [Regulations \(Standards - 29 CFR\) - Table of Contents](#)

• Part Number:	1910
• Part Title:	Occupational Safety and Health Standards
• Subpart:	Z
• Subpart Title:	Toxic and Hazardous Substances
• Standard Number:	1910.1450 App B
• Title:	References (Non-Mandatory)

The following references are provided to assist the employer in the development of a Chemical Hygiene Plan. The materials listed below are offered as non-mandatory guidance. References listed here do not imply specific endorsement of a book, opinion, technique, policy or a specific solution for a safety or health problem. Other references not listed here may better meet the needs of a specific laboratory. (a) Materials for the development of the Chemical Hygiene Plan:

1. American Chemical Society, Safety in Academic Chemistry Laboratories, 4th edition, 1985.
2. Fawcett, H.H. and W.S. Wood, Safety and Accident Prevention in Chemical Operations, 2nd edition, Wiley-Interscience, New York, 1982.
3. Flury, Patricia A., Environmental Health and Safety in the Hospital Laboratory, Charles C. Thomas Publisher, Springfield IL, 1978.
4. Green, Michael E. and Turk, Amos, Safety in Working with Chemicals, Macmillan Publishing

Co., NY, 1978.

5. Kaufman, James A., Laboratory Safety Guidelines, Dow Chemical Co., Box 1713, Midland, MI 48640, 1977.

6. National Institutes of Health, NIH Guidelines for the Laboratory use of Chemical Carcinogens, NIH Pub. No. 81-2385, GPO, Washington, DC 20402, 1981.

7. National Research Council, Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, Washington, DC, 1983.

8. National Research Council, Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, Washington, DC, 1981.

9. Renfrew, Malcolm, Ed., Safety in the Chemical Laboratory, Vol. IV, J. Chem. Ed., American Chemical Society, Easlon, PA, 1981.

10. Steere, Norman V., Ed., Safety in the Chemical Laboratory, J. Chem. Ed. American Chemical Society, Easlon, PA, 18042, Vol. I, 1967, Vol. II, 1971, Vol. III, 1974.

11. Steere, Norman V., Handbook of Laboratory Safety, the Chemical Rubber Company Cleveland, OH, 1971.

12. Young, Jay A., Ed., Improving Safety in the Chemical Laboratory, John Wiley & Sons, Inc. New York, 1987.

(b) Hazardous Substances Information:

1. American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes, 6500 Glenway Avenue, Bldg. D-7, Cincinnati, OH 45211-4438.

2. Annual Report on Carcinogens, National Toxicology Program U.S. Department of Health and Human Services, Public Health Service, U.S. Government Printing Office, Washington, DC, (latest edition).

3. Best Company, Best Safety Directory, Vols. I and II, Oldwick, N.J., 1981.

4. Bretherick, L., Handbook of Reactive Chemical Hazards, 2nd edition, Butterworths, London, 1979.

5. Bretherick, L., Hazards in the Chemical Laboratory, 3rd edition, Royal Society of Chemistry, London, 1986.

6. Code of Federal Regulations, 29 CFR part 1910 subpart Z. U.S. Govt. Printing Office, Washington, DC 20402 (latest edition).

7. IARC Monographs on the Evaluation of the Carcinogenic Risk of chemicals to Man, World Health Organization Publications Center, 49 Sheridan Avenue, Albany, New York 12210 (latest editions).

8. NIOSH/OSHA Pocket Guide to Chemical Hazards. NIOSH Pub. No. 85-114, U.S. Government Printing Office, Washington, DC, 1985 (or latest edition).

9. Occupational Health Guidelines, NIOSH/OSHA. NIOSH Pub. No. 81-123 U.S. Government Printing Office, Washington, DC, 1981.

10. Patty, F.A., Industrial Hygiene and Toxicology, John Wiley & Sons, Inc., New York, NY (Five Volumes).

11. Registry of Toxic Effects of Chemical Substances, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, Revised Annually, for sale from Superintendent of documents US. Govt. Printing Office, Washington, DC 20402.

12. The Merck Index: An Encyclopedia of Chemicals and Drugs. Merck and Company Inc. Rahway, N.J., 1976 (or latest edition).

13. Sax, N.I. Dangerous Properties of Industrial Materials, 5th edition, Van Nostrand Reinhold, NY., 1979.

14. Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals, Noyes Publications. Park Ridge, NJ, 1981.

(c) Information on Ventilation:

1. American Conference of Governmental Industrial Hygienists Industrial Ventilation (latest edition), 6500 Glenway Avenue, Bldg. D-7, Cincinnati, Ohio 45211-4438.

2. American National Standards Institute, Inc. American National Standards Fundamentals Governing the Design and Operation of Local Exhaust Systems ANSI Z 9.2-1979 American National Standards Institute, N.Y. 1979.

3. Imad, A.P. and Watson, C.L. Ventilation Index: An Easy Way to Decide about Hazardous Liquids, Professional Safety pp 15-18, April 1980.

4. National Fire Protection Association, Fire Protection for Laboratories Using Chemicals NFPA-45, 1982.

Safety Standard for Laboratories in Health Related Institutions, NFPA, 56c, 1980.

Fire Protection Guide on Hazardous Materials, 7th edition, 1978.

National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

5. Scientific Apparatus Makers Association (SAMA), Standard for Laboratory Fume Hoods, SAMA LF7-1980, 1101 16th Street, NW., Washington, DC 20036.

(d) Information on Availability of Referenced Material:

1. American National Standards Institute (ANSI), 1430 Broadway, New York, NY 10018.

2. American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103.

[55 FR 3327, Jan. 31, 1990; 57 FR 29204, July 1, 1992; 61 FR 5507, Feb. 13, 1996]

APPENDIX A1

**SUBPART Z – TOXIC AND HAZARDOUS SUBSTANCES: TABLE Z-1, TABLE Z-2
AND TABLE Z-3**

Regulations (Standards - 29 CFR)

TABLE Z-1 Limits for Air Contaminants. - 1910.1000 TABLE Z-1

- Part Number: 1910
 - Part Title: Occupational Safety and Health Standards
 - Subpart: Z
 - Subpart Title: Toxic and Hazardous Substances
 - Standard Number: 1910.1000 TABLE Z-1
 - Title: TABLE Z-1 Limits for Air Contaminants.
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TABLE Z-1 LIMITS FOR AIR CONTAMINANTS

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

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

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

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

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

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

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

Footnote(f) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit

which is the same as the inert or nuisance dust limit of Table Z-3.

Footnote(2) See Table Z-2.

Footnote(3) See Table Z-3

Footnote(4) Varies with compound.

TABLE Z-1. - LIMITS FOR AIR CONTAMINANTS

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

(as Sb).....	7440-36-0	.....	0.5	
ANTU (alpha Naphthylthiourea)....	86-88-4	.....	0.3	
Arsenic, inorganic compounds (as As); see 1910.1018.....	7440-38-2			
Arsenic, organic compounds (as As)....	7440-38-2	.....	0.5	
Arsine.....	7784-42-1	0.05	0.2	
Asbestos; see 1910.1001.....	(4)			
Azinphos-methyl.....	86-50-0	.....	0.2	X
Barium, soluble compounds (as Ba)....	7440-39-3	.....	0.5	
Barium sulfate.....	7727-43-7			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Benomyl.....	17804-35-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Benzene; See 1910.1028. See Table Z-2 for the limits applicable in the operations or sectors excluded in 1910.1028(d)	71-43-2			
Benzidine; See 1910.1010.....	92-87-5			
p-Benzoquinone; see Quinone.				
Benzo(a)pyrene; see Coal tar pitch volatiles.....				
Benzoyl peroxide.....	94-36-0	.....	5	
Benzyl chloride.....	100-44-7	1	5	
Beryllium and beryllium compounds (as Be).....	7440-41-7		(2)	
Biphenyl; see Diphenyl.				
Bismuth telluride, Undoped.....	1304-82-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Boron oxide.....	1303-86-2			
Total dust.....		.....	15	
Boron trifluoride.....	7637-07-2	©1 | ©3	|	
Bromine.....	7726-95-6	0.1	0.7	
Bromoform.....	75-25-2	0.5	5	X
Butadiene (1,3-Butadiene); See 29 CFR 1910.1051; 29 CFR 1910.19(1)....	106-99-0	1 ppm/5 ppm STEL		
Butanethiol; see Butyl mercaptan.				
2-Butanone				

(Methyl ethyl ketone)	78-93-3	200	590	
2-Butoxyethanol.....	111-76-2	50	240	X
n-Butyl-acetate.....	123-86-4	150	710	
sec-Butyl acetate.....	105-46-4	200	950	
tert-Butyl-acetate.....	540-88-5	200	950	
n-Butyl alcohol.....	71-36-3	100	300	
sec-Butyl alcohol.....	78-92-2	150	450	
tert-Butyl alcohol.....	75-65-0	100	300	
Butylamine.....	109-73-9	©5	©15	X
tert-Butyl chromate (as CrO(3)).....	1189-85-1	.....	©0.1	X
n-Butyl glycidyl ether (BGE).....	2426-08-6	50	270	
Butyl mercaptan.....	109-79-5	10	35	
p-tert-Butyltoluene....	98-51-1	10	60	
Cadmium (as Cd); see 1910.1027.....	7440-43-9			
Calcium Carbonate.....	1317-65-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Calcium hydroxide.....	1305-62-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Calcium oxide.....	1305-78-8		5	
Calcium silicate.....	1344-95-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Calcium sulfate.....	7778-18-9			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Camphor, synthetic.....	76-22-2		2	
Carbaryl (Sevin).....	63-25-2		5	
Carbon black.....	1333-86-4		3.5	
Carbon dioxide.....	124-38-9	5000	9000	
Carbon disulfide.....	75-15-0		(2)	
Carbon monoxide.....	630-08-0	50	55	
Carbon tetrachloride...	56-23-5		(2)	
Cellulose.....	9004-34-6			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Chlordane.....	57-74-9		0.5	X
Chlorinated camphene...	8001-35-2		0.5	X
Chlorinated diphenyl oxide.....	55720-99-5	.....	0.5	
Chlorine.....	7782-50-5	©1	©3	
Chlorine dioxide.....	10049-04-4	0.1	0.3	
Chlorine trifluoride...	7790-91-2	©0.1	©0.4	
Chloroacetaldehyde.....	107-20-0	©1	©3	
a-Chloroacetophenone (Phenacyl chloride)..	532-27-4	0.05	0.3	
Chlorobenzene.....	108-90-7	75	350	
o-Chlorobenzylidene malononitrile.....	2698-41-1	0.05	0.4	
Chlorobromomethane.....	74-97-5	200	1050	
2-Chloro-1,3-butadiene; See beta-Chloroprene.				

Chlorodiphenyl (42% Chlorine)(PCB)...	53469-21-9	.....	1	X
Chlorodiphenyl (54% Chlorine)(PCB)...	11097-69-1	.....	0.5	X
1-Chloro-2, 3-epoxypropane; See Epichlorohydrin.				
2-Chloroethanol; See Ethylene chlorohydrin				
Chloroethylene; See Vinyl chloride.				
Chloroform (Trichloromethane)...	67-66-3	©50 | ©240 |		
bis(Chloromethyl) ether; see 1910.1008.	542-88-1			
Chloromethyl methyl ether; see 1910.1006.	107-30-2			
1-Chloro-1-nitropropane	600-25-9	20	100	
Chloropicrin.....	76-06-2	0.1	0.7	
beta-Chloroprene.....	126-99-8	25	90	X
2-Chloro-6 (trichloromethyl) pyridine.....	1929-82-4			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Chromic acid and chromates (as CrO(3))	(4)		(2)	
Chromium (II) compounds (as Cr).....	7440-47-3	.....	0.5	
Chromium (III) compounds (as Cr)....	7440-47-3	.....	0.5	
Chromium metal and insol. salts (as Cr)..	7440-47-3	.....	1	
Chrysene; see Coal tar pitch volatiles.....				
Clopidol.....	2971-90-6			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Coal dust (less than 5% SiO(2)), respirable fraction..			(3)	
Coal dust (greater than or equal to 5% SiO(2)), respirable fraction.....			(3)	
Coal tar pitch volatiles (benzene soluble fraction), anthracene, BaP, phenanthrene, acridine, chrysene, pyrene.....	65966-93-2	.....	0.2	
Cobalt metal, dust, and fume (as Co).....	7440-48-4	.....	0.1	
Coke oven emissions; see 1910.1029.....				

Copper.....	7440-50-8				
Fume (as Cu).....		.....		0.1	
Dusts and mists (as Cu).....		.....		1	
Cotton dust (e), see 1910.1043.....		.....		1	
Crag herbicide (Sesone)	136-78-7				
Total dust.....		.....		15	
Respirable fraction..		.....		5	
Cresol, all isomers....	1319-77-3	5		22	X
Crotonaldehyde.....	123-73-9	2		6	
	4170-30-3				
Cumene.....	98-82-8	50		245	X
Cyanides (as CN)....	(4)	.....		5	X
Cyclohexane.....	110-82-7	300		1050	
Cyclohexanol.....	108-93-0	50		200	
Cyclohexanone.....	108-94-1	50		200	
Cyclohexene.....	110-83-8	300		1015	
Cyclopentadiene.....	542-92-7	75		200	
2,4-D (Dichlorophen- oxyacetic acid).....	94-75-7	.....		10	
Decaborane.....	17702-41-9	0.05		0.3	X
Demeton (Systox).....	8065-48-3	.....		0.1	X
Diacetone alcohol (4-Hydroxy-4-methyl- 2-pentanone).....	123-42-2	50		240	
1,2-Diaminoethane; see Ethylenediamine..					
Diazomethane.....	334-88-3	0.2		0.4	
Diborane.....	19287-45-7	0.1		0.1	
1,2-Dibromo-3- chloropropane (DBCP); see 1910.1044.....	96-12-8				
1,2-Dibromoethane; see Ethylenedibromide...					
Dibutyl phosphate.....	107-66-4	1		5	
Dibutyl phthalate.....	84-74-2	.....		5	
o-Dichlorobenzene.....	95-50-1	©50	©300		
p-Dichlorobenzene.....	106-46-7	75		450	
3,3'-Dichlorobenzidine; see 1910.1007.....	91-94-1				
Dichlorodifluoromethane	75-71-8	1000		4950	
1,3-Dichloro-5, 5-dimethyl hydantoin.	118-52-5	.....		0.2	
Dichlorodiphenyltri- chloroethane (DDT)...	50-29-3	.....		1	X
1,1-Dichloroethane.....	75-34-3	100		400	
1,2-Dichloroethane; see Ethylenedichloride..					
1,2-Dichloroethylene...	540-59-0	200		790	
Dichloroethyl ether....	111-44-4	©15	©90		X
Dichloromethane; see Methylene chloride...					
Dichloromonofluoro- methane.....	75-43-4	1000		4200	
1,1-Dichloro-1-					

nitroethane.....	594-72-9	©10	©60	
1,2-Dichloropropane; see Propylene dichloride.				
Dichlorotetrafluoro- ethane.....	76-14-2	1000	7000	
Dichlorvos (DDVP).....	62-73-7	.....	1	X
Dicyclopentadienyl iron Total dust.....	102-54-5	.....	15	
Respirable fraction..		.....	5	
Dieldrin.....	60-57-1	.....	0.25	X
Diethylamine.....	109-89-7	25	75	
2-Diethylaminoethanol..	100-37-8	10	50	X
Diethyl ether; see Ethyl ether.....				
Difluorodibromomethane.	75-61-6	100	860	
Diglycidyl ether (DGE).	2238-07-5	©0.5	©2.8	
Dihydroxybenzene; see Hydroquinone.....				
Diisobutyl ketone.....	108-83-8	50	290	
Diisopropylamine.....	108-18-9	5	20	X
4-Dimethylaminoazo- benzene; see 1910.1015.....	60-11-7			
Dimethoxymethane; see Methylal.....				
Dimethyl acetamide.....	127-19-5	10	35	X
Dimethylamine.....	124-40-3	10	18	
Dimethylaminobenzene; see Xylidine.....				
Dimethylaniline (N,N-Dimethylaniline)	121-69-7	5	25	X
Dimethylbenzene; see Xylene.....				
Dimethyl-1,2-dibromo-2, 2-dichloroethyl phosphate.....	300-76-5	.....	3	
Dimethylformamide.....	68-12-2	10	30	X
2,6-Dimethyl-4- heptanone; see Diisobutyl ketone....				
1,1-Dimethylhydrazine..	57-14-7	0.5	1	X
Dimethylphthalate.....	131-11-3	.....	5	
Dimethyl sulfate.....	77-78-1	1	5	X
Dinitrobenzene (all isomers).....			1	X
(ortho).....	528-29-0			
(meta).....	99-65-0			
(para).....	100-25-4			
Dinitro-o-cresol.....	534-52-1	.....	0.2	X
Dinitrotoluene.....	25321-14-6	.....	1.5	X
Dioxane (Diethylene dioxide).	123-91-1	100	360	X
Diphenyl (Biphenyl)....	92-52-4	0.2	1	
Diphenylmethane diisocyanate; see				

Methylene bisphenyl isocyanate.....				
Dipropylene glycol methyl ether.....	34590-94-8	100	600	X
Di-sec octyl phthalate (Di-(2-ethylhexyl) phthalate).....	117-81-7	.....	5	
Emery.....	12415-34-8			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Endrin.....	72-20-8	.....	0.1	X
Epichlorohydrin.....	106-89-8	5	19	X
EPN.....	2104-64-5	.....	0.5	X
1,2-Epoxypropane; see Propylene oxide.....				
2,3-Epoxy-1-propanol; see Glycidol.....				
Ethanethiol; see Ethyl mercaptan.....				
Ethanolamine.....	141-43-5	3	6	
2-Ethoxyethanol (Cellosolve).....	110-80-5	200	740	X
2-Ethoxyethyl acetate (Cellosolve acetate)..	111-15-9	100	540	X
Ethyl acetate.....	141-78-6	400	1400	
Ethyl acrylate.....	140-88-5	25	100	X
Ethyl alcohol (Ethanol)	64-17-5	1000	1900	
Ethylamine.....	75-04-7	10	18	
Ethyl amyl ketone (5-Methyl-3-heptanone).....	541-85-5	25	130	
Ethyl benzene.....	100-41-4	100	435	
Ethyl bromide.....	74-96-4	200	890	
Ethyl butyl ketone (3-Heptanone).....	106-35-4	50	230	
Ethyl chloride.....	75-00-3	1000	2600	
Ethyl ether.....	60-29-7	400	1200	
Ethyl formate.....	109-94-4	100	300	
Ethyl mercaptan.....	75-08-1	©10	©25	
Ethyl silicate.....	78-10-4	100	850	
Ethylene chlorohydrin..	107-07-3	5	16	X
Ethylenediamine.....	107-15-3	10	25	
Ethylene dibromide.....	106-93-4		(2)	
Ethylene dichloride (1,2-Dichloroethane)..	107-06-2		(2)	
Ethylene glycol dinitrate.....	628-96-6	©0.2	©1	X
Ethylene glycol methyl acetate; see Methyl cellosolve acetate...				
Ethyleneimine; see 1910.1012.....	151-56-4			
Ethylene oxide; see 1910.1047.....	75-21-8			
Ethylidene chloride; see 1,1-Dichlorethane				

N-Ethylmorpholine.....	100-74-3	20	94	X
Ferbam.....	14484-64-1			
Total dust.....		.....	15	
Ferrovandium dust.....	12604-58-9	.....	1	
Fluorides (as F).....	(4)	.....	2.5	
Fluorine.....	7782-41-4	0.1	0.2	
Fluorotrichloromethane (Trichloro- fluoromethane).....	75-69-4	1000	5600	
Formaldehyde; see 1910.1048.....	50-00-0			
Formic acid.....	64-18-6	5	9	
Furfural.....	98-01-1	5	20	X
Furfuryl alcohol.....	98-00-0	50	200	
Grain dust (oat, wheat barley).....	.....	.....	10	
Glycerin (mist).....	56-81-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Glycidol.....	556-52-5	50	150	
Glycol monoethyl ether; see 2-Ethoxyethanol..				
Graphite, natural respirable dust.....	7782-42-5		(3)	
Graphite, synthetic.... Total dust.....		.....	15	
Respirable Fraction..		.....	5	
Guthion; see Azinphos methyl..				
Gypsum.....	13397-24-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Hafnium.....	7440-58-6		0.5	
Heptachlor.....	76-44-8		0.5	X
Heptane (n-Heptane)....	142-82-5	500	2000	
Hexachloroethane.....	67-72-1	1	10	X
Hexachloronaphthalene..	1335-87-1	.....	0.2	X
n-Hexane.....	110-54-3	500	1800	
2-Hexanone (Methyl n-butyl ketone).....	591-78-6	100	410	
Hexone (Methyl isobutyl ketone).....	108-10-1	100	410	
sec-Hexyl acetate.....	108-84-9	50	300	
Hydrazine.....	302-01-2	1	1.3	X
Hydrogen bromide.....	10035-10-6	3	10	
Hydrogen chloride.....	7647-01-0	©5	©7	
Hydrogen cyanide.....	74-90-8	10	11	X
Hydrogen fluoride (as F).....	7664-39-3		(2)	
Hydrogen peroxide.....	7722-84-1	1	1.4	
Hydrogen selenide (as Se).....	7783-07-5	0.05	0.2	
Hydrogen sulfide.....	7783-06-4		(2)	
Hydroquinone.....	123-31-9	.....	2	
Iodine.....	7553-56-2	©0.1	©1	
Iron oxide fume.....	1309-37-1	.....	10	

Isomyl acetate.....	123-92-2	100	525	
Isomyl alcohol (primary and secondary).....	123-51-3	100	360	
Isobutyl acetate.....	110-19-0	150	700	
Isobutyl alcohol.....	78-83-1	100	300	
Isophorone.....	78-59-1	25	140	
Isopropyl acetate.....	108-21-4	250	950	
Isopropyl alcohol.....	67-63-0	400	980	
Isopropylamine.....	75-31-0	5	12	
Isopropyl ether.....	108-20-3	500	2100	
Isopropyl glycidyl ether (IGE).....	4016-14-2	50	240	
Kaolin.....	1332-58-7			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Ketene.....	463-51-4	0.5	0.9	
Lead inorganic (as Pb); see 1910.1025.....	7439-92-1			
Limestone.....	1317-65-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Lindane.....	58-89-9		0.5	X
Lithium hydride.....	7580-67-8		0.025	
L.P.G. (Liquified petroleum gas).....	68476-85-7	1000	1800	
Magnesite.....	546-93-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Magnesium oxide fume...	1309-48-4			
Total Particulate....		.....	15	
Malathion.....	121-75-5			
Total dust.....		.....	15	X
Maleic anhydride.....	108-31-6	0.25	1	
Manganese compounds (as Mn).....	7439-96-5	.....	©5	
Manganese fume (as Mn)..	7439-96-5	.....	©5	
Marble.....	1317-65-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Mercury (aryl and inorganic)(as Hg)....	7439-97-6		(2)	
Mercury (organo) alkyl compounds (as Hg)....	7439-97-6		(2)	
Mercury (vapor) (as Hg)	7439-97-6		(2)	
Mesityl oxide.....	141-79-7	25	100	
Methanethiol; see Methyl mercaptan.				
Methoxychlor.....	72-43-5			
Total dust.....		.....	15	
2-Methoxyethanol; (Methyl cellosolve)..	109-86-4	25	80	X
2-Methoxyethyl acetate (Methyl cellosolve acetate).....	110-49-6	25	120	X
Methyl acetate.....	79-20-9	200	610	

Methyl acetylene (Propyne).....	74-99-7	1000	1650	
Methyl acetylene propadiene mixture (MAPP).....		1000	1800	
Methyl acrylate.....	96-33-3	10	35	X
Methylal (Dimethoxy-methane)..	109-87-5	1000	3100	
Methyl alcohol.....	67-56-1	200	260	
Methylamine.....	74-89-5	10	12	
Methyl amyl alcohol; see Methyl Isobutyl carbinol.....				
Methyl n-amyl ketone...	110-43-0	100	465	
Methyl bromide.....	74-83-9	©20	©80	X
Methyl butyl ketone; see 2-Hexanone.....				
Methyl cellosolve; see 2-Methoxyethanol.				
Methyl cellosolve acetate; see 2-Methoxyethyl acetate.....				
Methyl chloride.....	74-87-3		(2)	
Methyl chloroform (1,1,1-Trichloro- ethane).....	71-55-6	350	1900	
Methylcyclohexane.....	108-87-2	500	2000	
Methylcyclohexanol.....	25639-42-3	100	470	
o-Methylcyclohexanone..	583-60-8	100	460	X
Methylene chloride.....	75-09-2		(2)	
Methyl ethyl ketone (MEK); see 2-Butanone				
Methyl formate.....	107-31-3	100	250	
Methyl hydrazine (Monomethyl hydrazine).....	60-34-4	©0.2	©0.35	X
Methyl iodide.....	74-88-4	5	28	X
Methyl isoamyl ketone..	110-12-3	100	475	
Methyl isobutyl carbinol.....	108-11-2	25	100	X
Methyl isobutyl ketone; see Hexone.....				
Methyl isocyanate.....	624-83-9	0.02	0.05	X
Methyl mercaptan.....	74-93-1	©10	©20	
Methyl methacrylate....	80-62-6	100	410	
Methyl propyl ketone; see 2-Pentanone.....				
alpha-Methyl styrene...	98-83-9	©100	©480	
Methylene bisphenyl isocyanate (MDI).....	101-68-8	©0.02	©0.2	
Mica; see Silicates....				
Molybdenum (as Mo).....	7439-98-7			
Soluble compounds....			5	
Insoluble Compounds				
Total dust.....			15	

Monomethyl aniline.....	100-61-8	2	9	X
Monomethyl hydrazine; see Methyl hydrazine.				
Morpholine.....	110-91-8	20	70	X
Naphtha (Coal tar).....	8030-30-6	100	400	
Naphthalene.....	91-20-3	10	50	
alpha-Naphthylamine; see 1910.1004.....	134-32-7			
beta-Naphthylamine; see 1910.1009.....	91-59-8			
Nickel carbonyl (as Ni)	13463-39-3	0.001	0.007	
Nickel, metal and insoluble compounds (as Ni).....	7440-02-0	.....	1	
Nickel, soluble compounds (as Ni)....	7440-02-0	.....	1	
Nicotine.....	54-11-5	.....	0.5	X
Nitric acid.....	7697-37-2	2	5	
Nitric oxide.....	10102-43-9	25	30	
p-Nitroaniline.....	100-01-6	1	6	X
Nitrobenzene.....	98-95-3	1	5	X
p-Nitrochlorobenzene... 4-Nitrodiphenyl; see 1910.1003.....	100-00-5 92-93-3	.....	1	X
Nitroethane.....	79-24-3	100	310	
Nitrogen dioxide.....	10102-44-0	©5	©9	
Nitrogen trifluoride...	7783-54-2	10	29	
Nitroglycerin.....	55-63-0	©0.2	©2	X
Nitromethane.....	75-52-5	100	250	
1-Nitropropane.....	108-03-2	25	90	
2-Nitropropane.....	79-46-9	25	90	
N-Nitrosodimethylamine; see 1910.1016				
Nitrotoluene (all isomers).....		5	30	X
o-isomer.....	88-72-2			
m-isomer.....	99-08-1			
p-isomer.....	99-99-0			
Nitrotrichloromethane; see Chloropicrin.....				
Octachloronaphthalene..	2234-13-1	.....	0.1	X
Octane.....	111-65-9	500	2350	
Oil mist, mineral.....	8012-95-1	.....	5	
Osmium tetroxide (as Os).....	20816-12-0	.....	0.002	
Oxalic acid.....	144-62-7	.....	1	
Oxygen difluoride.....	7783-41-7	0.05	0.1	
Ozone.....	10028-15-6	0.1	0.2	
Paraquat, respirable dust.....	4685-14-7 1910-42-5 2074-50-2	.....	0.5	X
Parathion.....	56-38-2	.....	0.1	X
Particulates not otherwise regulated (PNOR)(f).....				

Total dust.....		.....	15	
Respirable fraction..		.....	5	
PCB; see Chlorodiphenyl (42% and 54% chlorine).....				
Pentaborane.....	19624-22-7	0.005	0.01	
Pentachloronaphthalene.	1321-64-8	.....	0.5	X
Pentachlorophenol.....	87-86-5	.....	0.5	X
Pentaerythritol.....	115-77-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Pentane.....	109-66-0	1000	2950	
2-Pentanone (Methyl propyl ketone).....	107-87-9	200	700	
Perchloroethylene (Tetrachloroethylene)	127-18-4		(2)	
Perchloromethyl mercaptan.....	594-42-3	0.1	0.8	
Perchloryl fluoride....	7616-94-6	3	13.5	
Petroleum distillates (Naphtha)(Rubber Solvent).....		500	2000	
Phenol.....	108-95-2	5	19	X
p-Phenylene diamine....	106-50-3	.....	0.1	X
Phenyl ether, vapor....	101-84-8	1	7	
Phenyl ether-biphenyl mixture, vapor.....		1	7	
Phenylethylene; see Styrene.....				
Phenyl glycidyl ether (PGE).....	122-60-1	10	60	
Phenylhydrazine.....	100-63-0	5	22	X
Phosdrin (Mevinphos)...	7786-34-7	.....	0.1	X
Phosgene (Carbonyl chloride).....	75-44-5	0.1	0.4	
Phosphine.....	7803-51-2	0.3	0.4	
Phosphoric acid.....	7664-38-2	.....	1	
Phosphorus (yellow)....	7723-14-0	.....	0.1	
Phosphorus pentachloride.....	10026-13-8	.....	1	
Phosphorus pentasulfide	1314-80-3	.....	1	
Phosphorus trichloride.	7719-12-2	0.5	3	
Phthalic anhydride.....	85-44-9	2	12	
Picloram.....	1918-02-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Picric acid.....	88-89-1	.....	0.1	X
Pindone (2-Pivalyl-1, 3-indandione).....	83-26-1	.....	0.1	
Plaster of paris.....	26499-65-0			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Platinum (as Pt).....	7440-06-4			
Metal.....		.....	.....
Soluble Salts.....		.....	0.002	
Portland cement.....	65997-15-1			

Total dust.....		.....	15	
Respirable fraction..		.....	5	
Propane.....	74-98-6	1000	1800	
beta-Propriolactone; see 1910.1013.....	57-57-8			
n-Propyl acetate.....	109-60-4	200	840	
n-Propyl alcohol.....	71-23-8	200	500	
n-Propyl nitrate.....	627-13-4	25	110	
Propylene dichloride...	78-87-5	75	350	
Propylene imine.....	75-55-8	2	5	X
Propylene oxide.....	75-56-9	100	240	
Propyne; see Methyl acetylene.....				
Pyrethrum.....	8003-34-7	.....	5	
Pyridine.....	110-86-1	5	15	
Quinone.....	106-51-4	0.1	0.4	
RDX: see Cyclonite.....				
Rhodium (as Rh), metal fume and insoluble compounds.....	7440-16-6	.....	0.1	
Rhodium (as Rh), soluble compounds....	7440-16-6	.....	0.001	
Ronnel.....	299-84-3	.....	15	
Rotenone.....	83-79-4	.....	5	
Rouge.....				
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Selenium compounds (as Se).....	7782-49-2	.....	0.2	
Selenium hexafluoride (as Se).....	7783-79-1	0.05	0.4	
Silica, amorphous, precipitated and gel.	112926-00-8		(3)	
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2		(3)	
Silica, crystalline cristobalite, respirable dust.....	14464-46-1		(3)	
Silica, crystalline quartz, respirable dust.....	14808-60-7		(3)	
Silica, crystalline tripoli (as quartz), respirable dust.....	1317-95-9		(3)	
Silica, crystalline tridymite, respirable dust.....	15468-32-3		(3)	
Silica, fused, respirable dust.....	60676-86-0		(3)	
Silicates (less than 1% crystalline silica)				
Mica (respirable dust).....	12001-26-2		(3)	
Soapstone, total dust	.....		(3)	

Soapstone, respirable dust.....	.....		(3)	
Talc (containing asbestos): use asbestos limit: see 29 CFR 1910.1001.....			(3)	
Talc (containing no asbestos), respirable dust.....	14807-96-6		(3)	
Tremolite, asbestiform; see 1910.1001.....				
Silicon.....	7440-21-3			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Silicon carbide.....	409-21-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Silver, metal and soluble compounds (as Ag).....	7440-22-4	.....	0.01	
Soapstone; see Silicates.....				
Sodium fluoroacetate...	62-74-8	.....	0.05	X
Sodium hydroxide.....	1310-73-2	.....	2	
Starch.....	9005-25-8			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Stibine.....	7803-52-3	0.1	0.5	
Stoddard solvent.....	8052-41-3	500	2900	
Strychnine.....	57-24-9	.....	0.15	
Styrene.....	100-42-5		(2)	
Sucrose.....	57-50-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Sulfur dioxide.....	7446-09-5	5	13	
Sulfur hexafluoride....	2551-62-4	1000	6000	
Sulfuric acid.....	7664-93-9	.....	1	
Sulfur monochloride....	10025-67-9	1	6	
Sulfur pentafluoride...	5714-22-7	0.025	0.25	
Sulfuryl fluoride.....	2699-79-8	5	20	
Systox; see Demeton...				
2,4,5-T (2,4,5-tri-chlorophenoxyacetic acid).....	93-76-5	.....	10	
Talc; see Silicates...				
Tantalum, metal and oxide dust.....	7440-25-7	.....	5	
TEDP (Sulfotep).....	3689-24-5	.....	0.2	X
Tellurium and compounds (as Te)....	13494-80-9	.....	0.1	
Tellurium hexafluoride (as Te).....	7783-80-4	0.02	0.2	
Temephos.....	3383-96-8			
Total dust.....		.....	15	
Respirable fraction..		.....	5	

TEPP (Tetraethyl pyrophosphaate).....	107-49-3	.....	0.05	X
Terphenylis.....	26140-60-3	©1 | ©9		
1,1,1,2-Tetrachloro-2, 2-difluoroethane.....	76-11-9	500	4170	
1,1,2,2-Tetrachloro-1, 2-difluoroethane.....	76-12-0	500	4170	
1,1,2,2-Tetrachloroethane.....	79-34-5	5	35	X
Tetrachoroethylene; see Perchloroethylene				
Tetrachloromethane; see Carbon tetrachloride.				
Tetrachloronaphthalene.	1335-88-2	.....	2	X
Tetraethyl lead (as Pb)	78-00-2	.....	0.075	X
Tetrahydrofuran.....	109-99-9	200	590	
Tetramethyl lead, (as Pb).....	75-74-1	.....	0.075	X
Tetramethyl succinonitrile.....	3333-52-6	0.5	3	X
Tetranitromethane.....	509-14-8	1	8	
Tetryl (2,4,6-Trinitrophenylmethyl-nitramine).....	479-45-8	.....	1.5	X
Thallium, soluble compounds (as Tl)....	7440-28-0	.....	0.1	X
4,4'-Thiobis(6-tert, Butyl-m-cresol).....	96-69-5			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Thiram.....	137-26-8	.....	5	
Tin, inorganic compounds (except oxides) (as Sn).....	7440-31-5	.....	2	
Tin, organic compounds (as Sn).....	7440-31-5	.....	0.1	
Titanium dioxide.....	13463-67-7			
Total dust.....		.....	15	
Toluene.....	108-88-3		(2)	
Toluene-2, 4-diisocyanate (TDI).	584-84-9	©0.02 | ©0.14		
o-Toluidine.....	95-53-4	5	22	X
Toxaphene; see Chlorinated camphene.				
Tremolite; see Silicates.....				
Tributyl phosphate.....	126-73-8	.....	5	
1,1,1-Trichloroethane; see Methyl chloroform				
1,1,2-Trichloroethane..	79-00-5	10	45	X
Trichloroethylene.....	79-01-6		(2)	
Trichloromethane; see Chloroform				
Trichloronaphthalene....	1321-65-9	.....	5	X
1,2,3-Trichloropropane.	96-18-4	50	300	
1,1,2-Trichloro-1,2,				

2-trifluoroethane....	76-13-1	1000	7600	
Triethylamine.....	121-44-8	25	100	
Trifluorobromomethane..	75-63-8	1000	6100	
2,4,6-Trinitrophenol; see Picric acid.....				
2,4,6-Trinitrophenyl- methyl nitramine; see Tetryl.....				
2,4,6-Trinitrotoluene (TNT).....	118-96-7	.....	1.5	X
Triorthocresyl phosphate.....	78-30-8	.....	0.1	
Triphenyl phosphate....	115-86-6	.....	3	
Turpentine.....	8006-64-2	100	560	
Uranium (as U).....	7440-61-1			
Soluble compounds....		.....	0.05	
Insoluble compounds..		.....	0.25	
Vanadium.....	1314-62-1			
Respirable dust (as V(2)O(5)).....		.....	©0.5	
Fume (as V(2)O(5))...		.....	©0.1	
Vegetable oil mist.....				
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Vinyl benzene; see Styrene.....				
Vinyl chloride; see 1910.1017.....	75-01-4			
Vinyl cyanide; see Acrylonitrile				
Vinyl toluene.....	25013-15-4	100	480	
Warfarin.....	81-81-2	.....	0.1	
Xylenes (o-, m-, p-isomers)..	1330-20-7	100	435	
Xylidine.....	1300-73-8	5	25	X
Yttrium.....	7440-65-5	.....	1	
Zinc chloride fume....	7646-85-7	.....	1	
Zinc oxide fume.....	1314-13-2	.....	5	
Zinc oxide.....	1314-13-2			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Zinc stearate.....	557-05-1			
Total dust.....		.....	15	
Respirable fraction..		.....	5	
Zirconium compounds (as Zr).....	7440-67-7	.....	5	

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

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

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

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

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

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

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

Footnote(2) See Table Z-2.

Footnote(3) See Table Z-3

Footnote(4) Varies with compound.

Regulations (Standards - 29 CFR)

TABLE Z-2 - 1910.1000 TABLE Z-2

• Part Number:	1910
• Part Title:	Occupational Safety and Health Standards
• Subpart:	Z
• Subpart Title:	Toxic and Hazardous Substances
• Standard Number:	<u>1910.1000 TABLE Z-2</u>
• Title:	TABLE Z-2

TABLE Z-2

Substance	8-hour time weighted average	Acceptable ceiling concentra- tion	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift	
			Concen- tration	Maximum duration
Benzene(a) (Z37.40-1969).....	10 ppm.....	25 ppm.....	50 ppm...	10 minutes.
Beryllium and beryllium compounds (Z37.29-1970).....	2 ug/m(3)..	5 ug/m(3)..	25 ug/m(3)	30 minutes.
Cadmium fume(b) (Z37.5-1970).....	0.1 mg/m(3)	0.3 mg/m(3)	.....
Cadmium dust(b) (Z37.5-1970).....	0.2 mg/m(3)	0.6 mg/m(3)		
Carbon disulfide (Z37.3-1968).....	20 ppm.....	30 ppm.....	100 ppm..	30 minutes.
Carbon tetrachloride (Z37.17-1967).....	10 ppm.....	25 ppm.....	200 ppm..	5 min. in any 4 hrs.
Chromic acid and chromates (Z37-7-1971).....	.....	1 mg/10 m(3)		
Ethylene dibromide (Z37.31-1970).....	20 ppm.....	30 ppm.....	50 ppm...	5 minutes.
Ethylene dichloride (Z37.21-1969).....	50 ppm.....	100 ppm.....	200 ppm..	5 min. in any 3 hrs.
Fluoride as dust (Z37.28-1969).....	2.5 mg/m(3)	.....	.....
Formaldehyde: see 1910.1048.....	.....	.....	.....
Hydrogen fluoride (Z37.28-1969).....	3 ppm.....	.....	.....
Hydrogen sulfide (Z37.2-1966).....	.....	20 ppm.....	50 ppm...	10 mins. once only if no other meas. exp. occurs.
Mercury (Z37.8-1971).....	.....	1 mg/10m(3)	.....
Methylene chloride 5(Z37.18-1969).....	.....	.....	.....
Methylene Chloride: see 1910.1052.....				
Organo (alkyl)				

mercury (Z37.30-1969).....	0.01mg/m(3)	0.04 mg/m(3)	.....
Styrene (Z37.15-1969).....	100 ppm....	200 ppm....	600 ppm..	5 mins. in any 3 hrs.
Tetrachloroethylene (Z37.22-1967).....	100 ppm....	200 ppm....	300 ppm..	5 mins. in any 3 hrs.
Toluene (Z37.12-1967).....	200 ppm....	300 ppm....	500 ppm..	10 minutes
Trichloroethylene (Z37.19-1967).....	100 ppm....	200 ppm....	300 ppm..	5 mins. in any 2 hrs.

Footnote(a) This standard applies to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the benzene standard at 1910.1028.

Footnote(b) This standard applies to any operations or sectors for which the Cadmium standard, 1910.1027, is stayed or otherwise not in effect.

Regulations (Standards - 29 CFR)

TABLE Z-3 Mineral Dusts - 1910.1000 TABLE Z-3

- Part Number: 1910
- Part Title: Occupational Safety and Health Standards
- Subpart: Z
- Subpart Title: Toxic and Hazardous Substances
- Standard Number: 1910.1000 TABLE Z-3
- Title: TABLE Z-3 Mineral Dusts

Substance	mppcf ^a	mg/m ³
Silica:		
Crystalline		
Quartz (Respirable)	250 ^b	10 mg/m ³ ^c
Quartz (Total Dust)	%SiO ₂ +5	% SiO ₂ + 2
Cristobalite: Use ½ the value calculated from the count or mass formulae for quartz		30 mg/m ³
Tridymite: Use ½ the value calculated from the formulae for quartz		% SiO ₂ + 2
Amorphous, including natural diatomaceous earth	20	80 mg/m ³
Silicates (less than 1% crystalline silica):		%SiO ₂
Mica	20	
Soapstone	20	
Talc (not containing asbestos)	20 ^c	
Talc (containing asbestos) Use asbestos limit.		
Tremolite, asbestiform (see 29 CFR 1910.1001).		
Portland cement	50	
Graphite (Natural)	15	
Coal Dust:		
Respirable fraction less than 5% SiO ₂		2.4 mg/m ³ ^e
Respirable fraction greater than 5% SiO ₂		10 mg/m ³ ^e
Inert or Nuisance Dust: ^d		%SiO ₂ +2
Respirable fraction	15	5 mg/m ³
Total dust	50	15 mg/m ³

Note—Conversion factors - mppcf X 35.3 = million particles per cubic meter = particles per c.c.

^a Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.

^b The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

^c Containing less than 1% quartz; if 1% quartz or more, use quartz limit.

^d All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.

^e Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size-selector with the following characteristics:

Aerodynamic diameter (unit density sphere)	Percent passing selector
2	90
2.5	75
3.5	50
5.0	25
10	0

The measurements under this note refer to the use of an AEC (now NRC) instrument. The respirable fraction of coal dust is determined with an MRE; the figure corresponding to that of 2.4 mg/m³ in the table for coal dust is 4.5 mg/m³.

APPENDIX B

LABORATORY SAFETY STANDARD CHECKLIST



THE NEW YORK CITY DEPARTMENT OF EDUCATION

JOEL I. KLEIN, *Chancellor*

DIVISION OF HUMAN RESOURCES
OFFICE OF OCCUPATIONAL SAFETY & HEALTH (OOSH)
65 Court Street -Room 706
Brooklyn, New York 11201

**LABORATORY SAFETY & HEALTH STANDARD
COMPLIANCE CHECKLIST**

SCHOOL NAME:		REGION:
SCHOOL ADDRESS:		
PHONE #:	FAX #:	DISTRICT:

YES NO

PROGRAM ADMINISTRATION

- Is there a Chemical Hygiene Officer at the facility?
- Is there a written chemical hygiene plan at the facility?
- Is the chemical hygiene plan completed?

ARE EMPLOYEES FAMILIAR WITH

- Name and location of Chemical Hygiene Officer?
- OSHA's laboratory standard?
- The NYCDOE chemical hygiene plan?
- Where to find the Chemical Hygiene Plan?
- Where to find the Material Safety Data Sheets (MSDSs)?

POSTINGS

- Is the chemical hygiene poster conspicuously displayed?

TRAINING

- Is training provided for employees handling or working with chemicals?
- Is training documented?
- Do employees understand the hazards associated with chemicals?

RECORD KEEPING

- Are chemical training records kept for three years?

MATERIAL SAFETY DATA SHEETS

- Is a MSDS kept for each chemical on site?

- Are MSDSs easily accessible to employees?

YES NO

CHEMICALS

- Are chemicals properly stored?
- Are flammables and combustibles properly stored?
- Is a chemical inventory taken annually?
- Is a chemical inventory available at the site?
- Are all chemicals labels complete?
- Are all chemical labels legible?
- Do all chemicals labels identify the chemicals?
- Do all chemicals labels identify possible chemical, physical and health hazards?

PERSONNEL PROTECTIVE EQUIPMENT

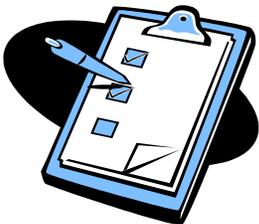
- Is PPE provided for the individuals working with chemicals?
- Are affected employees trained in the use, limitations, location, handling, decontamination and disposal of PPE?

SAFETY

- Are fire extinguishers inspected and tagged?
- Is there a dedicated ventilation system for the chemical store room and the laboratory?

WASTE REMOVAL

- Is hazardous waste removed in accordance with state guidelines?



Chemical Hygiene Officer (Print)

Principal's Signature

Chemical Hygiene Officer (Signature)

Date

Note: For each **no** answer above, attach an explanation and forward Checklist to OOSH within a week after completion.

<p>Please forward to:</p>	<p>New York City Department of Education Office of Occupational Safety and Health (OOSH) 65 Court Street, Room 706 Phone: (718) 935-2319 Fax: (718) 935-4682 Emerson Greenidge, MS, CSP, Director Rev. 1/06</p>
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APPENDIX C

HAZARDOUS CHEMICAL EXPOSURE INCIDENT REPORT



THE NEW YORK CITY DEPARTMENT OF EDUCATION

JOEL I. KLEIN, Chancellor

DIVISION OF HUMAN RESOURCES
OFFICE OF OCCUPATIONAL SAFETY & HEALTH (OOSH)
65 Court Street -Room 706
Brooklyn, New York 11201

HAZARDOUS CHEMICAL EXPOSURE INCIDENT REPORT-PART I

Use this form to document routes and circumstances of a hazardous chemical exposure incident.

PART I-TO BE FILLED OUT BY EXPOSED EMPLOYEE

CONFIDENTIAL

WHAT PART(S) OF YOUR BODY WAS EXPOSED?	ESTIMATE THE SIZE OR THE AREA OF YOU BODY THAT WAS EXPOSED?
HOW LONG DID THE EXPOSURE LAST?	
IS MATERIAL SAFETY DATA SHEET FOR CHEMICALS IN USE ATTACHED TO THIS REPORT? <input type="checkbox"/> YES <input type="checkbox"/> NO	
NOTE SIGNS AND SYMPTOMS DEVELOPED, IF ANY:	
ARE SIGNS AND SYMPTOMS DEVELOPED DOCUMENTED ON MSDS? <input type="checkbox"/> YES <input type="checkbox"/> NO	
IS EXPOSURE MONITORING DATA AVAILABLE? <input type="checkbox"/> YES <input type="checkbox"/> NO	

EMPLOYEE'S SIGNATURE

PRINCIPAL'S SIGNATURE:

DATE

DATE

As stipulated and in accordance with 29 CFR 1910.20, the Occupational Exposure to Hazardous Chemicals in Laboratories standard 29 CFR 1910.1450, form and related documentation will be kept on file by the New York City Department of Education for the length of employment and 30 years. This form and related documentation will remain confidential. Personal identifying information will be released with your consent only.



THE NEW YORK CITY DEPARTMENT OF EDUCATION

JOEL I. KLEIN, *Chancellor*

DIVISION OF HUMAN RESOURCES
OFFICE OF OCCUPATIONAL SAFETY & HEALTH (OOSH)
65 Court Street -Room 706
Brooklyn, New York 11201

HAZARDOUS CHEMICAL EXPOSURE INCIDENT REPORT- PART II

Use this form to document routes and circumstances of a hazardous chemical exposure incident.

PARTII-TO BE FILLED OUT BY SCHOOL ADMINISTRATOR/CHEMICAL HYGIENE OFFICER

CONFIDENTIAL

ANSWER ALL QUESTIONS. BE SPECIFIC. PLEASE PRINT.	
RECORD NUMBER _____ - _____ - _____ - _____ / _____ (BUILDING CODE #-YY-MM-DD/CASE #) EX: (123K-04-09-01/01)	DATE COMPLETED:
EMPLOYEE NAME:	
HOME TELEPHONE:	OTHER CONTACT NUMBER:
WORK SITE NAME/ LOCATION:	
WORK SITE DOE CODE# (EXAMPLE 555K):	WORK TELEPHONE:
IS A COMPREHENSIVE ACCIDENT REPORT DETAILING THIS INCIDENT ON FILE?	
<input type="checkbox"/> YES <input type="checkbox"/> NO	
IS AN SH 900 AND RELATED DOCUMENTS DETAILING THIS INCIDENT ON FILE?	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT APPLICABLE	
IF NO OR N/A, EXPLAIN:	
COMPLETED COPY FORWARDED TO :	
<input type="checkbox"/> Regional Representative (enter name and address):	<input type="checkbox"/> New York City Department Of Education Office of Occupational Safety and Health 65 Court Street, Room 706 Brooklyn, NY 11201 Phone #: (718) 935-2319 Fax #: (718) 935-4682

CHEMICAL HYGIENE OFFICER'S SIGNATURE

PRINCIPAL'S SIGNATURE:

DATE

DATE

As stipulated and in accordance with 29 CFR 1910.20, the Occupational Exposure to Hazardous Chemicals in Laboratories standard 29 CFR 1910.1450, form and related documentation will be kept on file by the New York City Department of Education for the length of employment and 30 years. This form and related documentation will remain confidential. Personal identifying information will be released with your consent only.

HAZARDOUS CHEMICAL EXPOSURE INCIDENT FOLLOW-UP RECORD



THE NEW YORK CITY DEPARTMENT OF EDUCATION

JOEL I. KLEIN, Chancellor

DIVISION OF HUMAN RESOURCES
OFFICE OF OCCUPATIONAL SAFETY & HEALTH (OOSH)
65 Court Street -Room 706
Brooklyn, New York 11201

HAZARDOUS CHEMICAL EXPOSURE INCIDENT FOLLOW-UP RECORD PART A

Use this form to record medical evaluation follow-up Report.

PART A--TO BE COMPLETED BY EXPOSED EMPLOYEE

CONFIDENTIAL

RECORD NUMBER _____ - _____ - _____ / _____ (BUILDING CODE #-YY-MM-DD/CASE #) EX: (123K-04-09-01/01)	
NAME OF EXPOSED EMPLOYEE:	DATE COMPLETED:
WORK NAME/ LOCATION:	
JOB TITLE AT TIME OF EXPOSURE:	
DATE OF EXPOSURE:	TIME OF EXPOSURE:
DATE OF FOLLOW-UP APPOINTMENT	
REASON FOR FOLLOW-UP	

EMPLOYEE'S SIGNATURE

PRINCIPAL'S SIGNATURE

DATE

DATE

COMPLETED COPY FORWARDED TO REGIONAL REPRESENTATIVE

COMPLETED COPY FORWARDED TO: OFFICE OF OCCUPATIONAL SAFETY AND HEALTH
65 COURT STREET-ROOM 706
BROOKLYN, NY 11201
PHONE: (718) 935-2319
FAX: (718) 935-4682

As stipulated and in accordance with 29 CFR 1910.20, the Occupational Exposure to Hazardous Chemicals in Laboratories standard 29 CFR 1910.1450, form and related documentation will be kept on file by the New York City Department of Education for the length of employment and 30 years. This form and related documentation will remain confidential. Personal identifying information will be released with your consent only.



THE NEW YORK CITY DEPARTMENT OF EDUCATION

JOEL I. KLEIN, Chancellor

DIVISION OF HUMAN RESOURCES
OFFICE OF OCCUPATIONAL SAFETY & HEALTH (OOSH)
65 Court Street -Room 706
Brooklyn, New York 11201

HAZARDOUS CHEMICAL EXPOSURE INCIDENT FOLLOW-UP RECORD PART B

Use this form to record medical evaluation follow-up Report.

PART B-- TO BE COMPLETED EXPOSED EMPLOYEE'S MEDICAL CARE PROVIDER

CONFIDENTIAL

EXPOSED EMPLOYEE FOLLOW-UP	
RECORD NUMBER _____ - _____ - _____ - _____ / _____ (BUILDING CODE #-YY-MM-DD/CASE #) EX: (123K-04-09-01/01)	
NAME/AFFILIATION:	
EMPLOYEE HEALTH FILE REVIEWED: <input type="checkbox"/> YES <input type="checkbox"/> NO	DATE
MEDICAL CARE PROVIDER FINDINGS & OBSERVATIONS	
MEDICAL CARE PROVIDER'S NAME:	MEDICAL CARE PROVIDER'S PHONE NUMBER:
MEDICAL CARE PROVIDER'S SIGNATURE:	DATE:

COMPLETED COPY FORWARDED TO REGIONAL REPRESENTATIVE

COMPLETED COPY FORWARDED TO: OFFICE OF OCCUPATIONAL SAFETY AND HEALTH
65 COURT STREET-ROOM 706
BROOKLYN, NY 11201
PHONE: (718) 935-2319
FAX: (718) 935-4682

As stipulated and in accordance with 29 CFR 1910.20, the Occupational Exposure to Hazardous Chemicals in Laboratories standard 29 CFR 1910.1450, form and related documentation will be kept on file by the New York City Department of Education for the length of employment and 30 years. This form and related documentation will remain confidential. Personal identifying information will be released with your consent only.

APPENDIX D

TARGET ORGAN POSTER

Target Organ Poster

A list of organ target effects shall be posted in a central location for access by all employees as follows:

CATEGORY	TARGET ORGAN EFFECTS/ SIGNS & SYMPTOMS	EXAMPLES OF CHEMICALS
Hepatotoxins	results in liver damage; jaundice, liver enlargement	carbon tetrachloride, nitrosamines
Nephrotoxins	results in kidney damage; edema, proteinuria	halogenated hydrocarbons
Neurotoxins	affects the nervous system; sleepiness, decrease in motor function, behavioral changes	mercury, carbon disulfide
Hematopoietic agent	decreases hemoglobin function and affects formation of blood cells; cyanosis, unconsciousness	carbon monoxide, cyanides
Pulmonary agent	irritate or damage the lungs; cough, shortness of breath, tightness in the chest	asbestos, silica
Reproductive toxin	affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis); birth defects, sterility	lead
Cutaneous (skin) hazard	affect the dermal layer of the body; rash, irritation, defatting of the skin	chlorinated compounds, ketones
Eye hazard	affect the eye or vision; conjunctivitis, corneal damage	organic solvents, acids
Carcinogens	facilitate cancer formation; no early warning signs in most cases	benzene, vinyl chloride

APPENDIX E

EMPLOYEE ATTENDANCE RECORD

LABORATORY SAFETY & HEALTH TRAINING ATTENDANCE SHEET

LABORATORY SAFETY & HEALTH TRAINING ATTENDANCE SHEET

MUST BE KEPT AT THE SITE AND ON FILE FOR 3 YEARS

Trainer's Name:		Affiliation/Title		
Training Location:		Site Address:		
Target Group:		Date:		Time:
Training Package Attached To Training Attendance Sheet:			Yes	No

Please Print All Information

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	REGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
1.		/ /				
2.		/ /				
3.		/ /				
4.		/ /				
5.		/ /				
6.		/ /				
7.		/ /				
8.		/ /				
9.		/ /				
10		/ /				
11.		/ /				

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	REGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
12.		/ /				
13.		/ /				
14.		/ /				
15.		/ /				
16.		/ /				
17.		/ /				
18.		/ /				
19.		/ /				
20.		/ /				
21.		/ /				
22.		/ /				
23.		/ /				
24.		/ /				
25.		/ /				
26.		/ /				

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	REGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
27.		/ /				
28.		/ /				
29.		/ /				
30.		/ /				
31.		/ /				
32.		/ /				
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38.		/ /				
39.		/ /				
40.		/ /				
41.		/ /				

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	REGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
42.		/ /				
43.		/ /				
44.		/ /				
45.		/ /				
46.		/ /				
47.		/ /				
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55.		/ /				
56.		/ /				

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	REGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
57.		/ /				
58.		/ /				
59.		/ /				
60.		/ /				
61.		/ /				
62.		/ /				
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69.		/ /				
70.		/ /				
71		/ /				

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	REGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
72.		/ /				
73.		/ /				
74.		/ /				
75.		/ /				
76.		/ /				
77.		/ /				
78.		/ /				
79.		/ /				
80.		/ /				
81.		/ /				
82.		/ /				
83.		/ /				
84.		/ /				
85.		/ /				
86.		/ /				

EMPLOYEE NAME	EMPLOYEE TITLE	SOC. SEC. #	WORK LOCATION	EGION	DISTRICT	SIGNATURE
Sample: John/Jane Doe	Lab Specialist	123 /45/ 6789	PS 123 Q	5	19	
87.		/ /				
88.		/ /				
89.		/ /				
90.		/ /				
91		/ /				
92		/ /				
93.		/ /				
94		/ /				
95.		/ /				
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97.		/ /				
98.		/ /				
99.		/ /				
100.		/ /				

APPENDIX F

DOT HAZARD CLASSIFICATION LIST

DOT HAZARD CLASSIFICATION LIST

Hazard Classifications

Example

Explosive A and B	Dynamite
Explosive C	Fireworks
Blasting agents	Plastic explosives
Radioactive material	C-60 or I-130
Flammable liquids	Alcohol
Non-flammable compressed gases	Nitrogen
Flammable gases	Oxygen
Combustible liquids	Xylene
Flammable solids	Paraffine Wax
Oxidizer	Nitric acid
Corrosive material	Hydrochloric acid
Irritating material	Lachrymator
Poison A	Heptachlor
Poison B	Phenol
Organic peroxide	Bexoyl peroxide
*ORM-A	Formaldehyde
ORM-B	Mercury
ORM-C	Asbestos
ORM-D	Bleach
ORM-E	Ferric sulfate
Etiological agents	Microorganisms (E-coli)

*ORM=Other Regulated Material

APPENDIX G

EPA HAZARD CLASSIFICATION LIST

EPA HAZARD CLASSIFICATION LIST

1. **IGNITABLE WASTE** Flash point < 140⁰F
Flammable solids (10)
Oxidizers (11)
Flammable gases (8)
Some combustible liquids (9)
Flammable liquids (5)
Pyrophoric liquids (6)
2. **CORROSIVES** Any liquid of pH ≤ 2 or ≥ 12.5 (12)
3. **REACTIVE** Explosives A, B or C (1,2 or 3)
Water reactive
Cyanide or sulfide
Organic peroxides (16)
Poison B (15)

4. **EXTRACTION PROCEDURE (EP) TOXIC**

8 Metals:

Arsenic	Silver
Cadmium	Lead
Chromium	Beryllium
Mercury	Thallium

4 Pesticides:

Lindane	Toxaphene
Endrin	Methoxychlor

2 Herbicides:

2,4 D	2,4,5 T
-------	---------

Poison A and some poison B (14 and 15)
Irritating material (13)
Radioactive material (4)
ORM-A-B-C (17, 18 and 19)
ORM-E (21)

NOTE: Numerals in parentheses indicate chemical categories on the DOT list.

APPENDIX H

HOW TO COMPLETE CHEMICAL INVENTORY

NEW YORK CITY DEPARTMENT OF EDUCATION CHEMICAL INVENTORY

How To Complete The Chemical Inventory

Please be aware that for purposes of this inventory, the term **chemical** refers to any liquid, gas or solid used in the school or facility e.g., "floor stripper; rubber cement; or duplicating fluid", as well as items used in science, vocational or trade shops.

- A. **Each Room** in your facility must be surveyed. This includes annexes, basements and storage closets. Use a **new** form for **each** room.
- B. List **all** chemical substances found in the room. Do **not** list articles such as furniture, machinery, or equipment. If you are not sure whether a substance should be included, list it anyway. If there are too many chemicals in the room to fit on one sheet, use additional sheets and number each successive sheet.
- C. If there are no chemicals in a room, prepare a form for that room and write "No Chemicals".
- D. Please make sure that the heading on the form is carefully filled out. Put your name and telephone number on the form, in order that you may be contacted if there are any questions about an entry.
- E. Enter "N/A" in every space where information is **not available**. Do not leave any space blank.
- F. Please **print** all information **clearly**.

Item 1 - Product Name

Enter the name as it is listed on the product label e.g. "Red Devil Paint" or "Phenol".

Item 2 - Manufacturer's Name, Address and Telephone Number

This information is found on the label; if there is a telephone number, please list this also.

Item 3 - Exact Storage Location

By law, storage location must be precise. State exactly where in the room the product is stored e.g. "under copy machine; third closet from the window."

Item 4 - Warnings on Label

State the immediate health hazard listed on the label e.g., "eye irritation, flammable, skin burns." If there are no warnings on the label, write "No Warnings Indicated."

Item 5 - Other Identifying Information

Use this column to describe the product. List the ingredients as they appear on the label. List as many ingredients as you can. If the container has no label, use this space to describe the item e.g., "floor cleaner; white powder in can; liquid in brown bottle."

If the label has a Chemical Abstracts Service (CAS) number please write this number in the space provided. If one does not exist, write "N/A" in the space provided.

Item 6 - Physical State

Each chemical will be either a pure chemical e.g., "acetone; nitric acid" or a product mixture e.g., "Titan's Floor Stripper; Speedball Textile Ink." Use codes listed on the inventory sheet.

Item 7 - Quantity

Number of containers e.g., 50 bottles, 13 cans, 6 boxes.

Item 8 - Container type

Use code listed at the bottom of the inventory sheet.

Item 9 - Units of Measure

Use code listed on the bottom of the inventory sheet to describe the size or volume of the container e.g., 6 oz, 1 g. If units of measure are metric, use the metric measure, it is not necessary to convert.

Item 10 - # Employees Exposed

Enter the number of employees who handle the substance or who may be routinely exposed to the substance.

Item 11 - Frequency of Use

Use the code listed at the bottom of the inventory sheet.

Item 12 - MSDS

A Material Safety Data Sheet (MSDS) is supplied by the manufacturer of the chemical substance. Check this box if a MSDS is on file in your school. If you **do not know** whether your school has a MSDS for a particular product, enter "N/A" in this box.

APPENDIX H-1

SAFETY PRECAUTIONS FOR CONDUCTING THE CHEMICAL INVENTORY

Safety Precautions for Conducting the Chemical Inventory

Chemical inventories are generally routine and without hazard. However, for your own protection, please follow these few simple guidelines:

1. To ensure your personal safety, always let someone know where you will be when conducting the inventory. This is especially important in very large or isolated areas.
2. To the extent possible, try to avoid touching and/or moving bottles and containers during the inventory.
3. If you have access to gloves, use them before handling chemical containers.
4. Do **not** shake, drop, open or sniff containers or bottles.
5. Do **not** discard old chemicals. Arrangements for proper disposal of chemicals will be made at a later time.
6. Contact your supervisor if:
 - i. You find unlabeled containers with solid or crystallized residues on the exterior of the container. Do **not** touch them. Simply make a note of the container, its label and location and give this information to your supervisor.
 - ii. You accidentally cause a spill or find evidence of spilled chemicals or come across containers that are ready to break open. **Stop** the inventory in that area and let your supervisor know immediately.

APPENDIX H-2

SAMPLE CHEMICAL INVENTORY LIST

SAMPLE

PRINT OR TYPE ALL INFORMATION

CHEMICAL INVENTORY

Page 1 of 1

School/Division P.S 118 /Region 5			Name Jane Smith		Physical State	Quantity	Container Type	Units of Measure	# of Employees Routinely Exposed	Frequency of Use	MSDS on File?
Address 123-45 Court Street, Brooklyn 11245			Title Teacher								
Department Industrial Arts		Room 126	Work Phone (718) 123-4567	Date 11/30/00							
1 Product Trade Name	2 Manufacturer's Name & Address	3 Exact Storage Location	4 Warnings on Label	5 Other Identifying Information							
Beacon Ammonia	Q-Pac Corporation 2145 Ave. C, Newark NJ 07104	Second shelf in large metal cabinet	Irritation to eyes, skin and mucous membranes	CAS # 1336-21-6	P L	2	N	1 G	2	S	√
Cosco Powder	Cosco Enterprises No Address Tel. (718) 383-4488	Under sink	Irritation of open cuts	White powder in box CAS # N/A	S M	1	K	16 oz	5	N	N/A
N/A	N/A	Top shelf in large metal cabinet	N/A	Clear liquid in glass bottle CAS # N/A	L	1	M	8 fl	2	N	N/A
Fleet Latex Paint	Long Island Paint 1 Continental Hill Glencove, NY 11542	On floor in storage closet	Harmful if swallowed	Titanium Dioxide CAS #	L M	3	F	1 G	5	S	N/A
N/A	Ricon Company Ltd. 136 Nakamagome, Ota-ku Toyko, Japan	Cabinet under copy machine	High vapor concentration – irritating to eyes and respiratory tract	Carbon black, Acrylic resin, Naphtha CAS # N/A	L M	4	N	16 oz	8	O	√
Acetylene	Airweld Industries No Address	Chained to south wall	Flammable vapors may cause dizziness	CAS # 74-86-2	G P	1	L	C	10	O	N/A

Physical State – Item 6	Container Type – Item 8			Units of Measure – Item 9	Frequency of Use – Item 11
S – Solid or Powder	A – Above ground tank	F – Can	M – Glass bottles or Jugs	C – Cubic feet for gas	S – Sometimes
L – Liquid	B – Below ground tank	I – Fiber drum	N – Plastic bottles or Jugs	lb – Pounds for solids	O – Often
G – Gas	C – Tank inside building	J – Bag	O – Tote Bin	oz – Ounces for solids	N - Never
P – Pure	D – Steel drum	K – Box	R - Other	G – Gallons for liquid	
M - Mixture	E – Plastic or non-metallic drum	L – Cylinder		fl – Fluid ounces for liquid	

NEW YORK CITY DEPARTMENT OF EDUCATION
 DIVISION OF HUMAN RESOURCES
 OFFICE OF OCCUPATIONAL SAFETY AND HEALTH
 Revised 1/06

CHEMICAL INVENTORY

PRINT OR TYPE ALL INFORMATION

Page ____ of ____

School/Division		Name of person completing form			Physical State	Quantity	Container Type	Units of Measure	# of Employees Routinely Exposed	Frequency of Use	MSDS on File?
Address		Title									
Department		Room	Work Phone	Date							
1 Product Trade Name	2 Manufacturer's Name & Address	3 Exact Storage Location	4 Warnings on Label	5 Other Identifying Information	6	7	8	9	10	11	12
				CAS #							
				CAS #							
				CAS #							
				CAS #							
				CAS #							
				CAS #							

<u>Physical State – Item 6</u>	<u>Container Type – Item 8</u>			<u>Units of Measure – Item 9</u>	<u>Frequency of Use – Item 11</u>
S – Solid or Powder	A – Above ground tank	F – Can	M – Glass bottles or Jugs	C – Cubic feet for gas	S – Sometimes
L – Liquid	B – Below ground tank	I – Fiber drum	N – Plastic bottles or Jugs	lb – Pounds for solids	O – Often
G – Gas	C – Tank inside building	J – Bag	O – Tote Bin	oz – Ounces for solids	N - Never
P – Pure	D – Steel drum	K – Box	R - Other	G – Gallons for liquid	
M - Mixture	E – Plastic or non-metallic drum	L – Cylinder		fl – Fluid ounces for liquid	

NEW YORK CITY DEPARTMENT OF EDUCATION
 DIVISION OF HUMAN RESOURCES
 OFFICE OF OCCUPATIONAL SAFETY AND HEALTH
 Revised 1/06

APPENDIX I

SAMPLE LETTER REQUESTING MATERIAL SAFETY DATA SHEET (MSDS)

SAMPLE LETTER FOR REQUESTING MSDS

Date

Manufacturer's Name
Address

Dear:

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) and Article 28 of the New York State Law requires that we obtain Material Safety Data Sheets (MSDSs) for hazardous substances used in our facility, and to make these MSDSs available to employees potentially exposed to these hazardous substances.

We are requesting a copy of the MSDS for your Product _____. In addition, please forward any additional information, supplemental MSDSs; or any other relevant data that your company or supplier has concerning the safety and health aspects of this product.

Your prompt attention to this matter is appreciated. Delays in receiving the MSDS information will affect the decision regarding future purchasing of your product by the New York City Department of Education.

Thank you for your timely response to this request. If you have any questions, please contact _____ at () _____.

Sincerely,

APPENDIX J

SAMPLE MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET-MSDS

Section 1 - Product and Company Identification
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Product Identification: SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Date of MSDS: 01/28/1991 **Technical Review Date:** 01/17/1997

FSC: 6550 **NIIN:** LIIN: 00F042470

Submitter: F BT

Status Code: C

MFN: 02

Article: N

Kit Part: Y

Manufacturer's Information

Manufacturer's Name: OMEGA ENGINEERING INC

Post Office Box: 4047

Manufacturer's Address1: 1 OMEGA DR

Manufacturer's Address2: STAMFORD, CT 06907-0047

Manufacturer's Country: US

General Information Telephone: 203-359-1660/813-979-0626

Emergency Telephone: 203-359-1660/800-255-3924

Emergency Telephone: 203-359-1660/800-255-3924

MSDS Preparer's Name: N/P

Proprietary: N

Reviewed: Y

Published: Y

CAGE: 29907

Special Project Code: N

Preparer Information

Preparer's Name: OMEGA ENGINEERING INC.

Post Office Box: 4047

Preparer's Address1: ONE OMEGA DRIVE

Preparer's Address2: STAMFORD, CT 06907-0047

Preparer's CAGE: 29907

Assigned Individual: N

Contractor Information

Contractor's Name: OMEGA ENGINEERING INC.

Post Office Box: 4047

Contractor's Address1: ONE OMEGA DRIVE

Contractor's Address2: STAMFORD, CT 06907-0047

Contractor's Telephone: 203-359-1660

Contractor's CAGE: 29907

Section 2 - Composition/Information on Ingredients
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Ingredient Name: SODIUM BICARBONATE
Ingredient CAS Number: 144-55-8 **Ingredient CAS Code:** M
RTECS Number: VZ0950000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Environmental Weight:
Other REC Limits: N/K
OSHA PEL: N/K **OSHA PEL Code:** M
OSHA STEL: **OSHA STEL Code:**
ACGIH TLV: N/K **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Health Hazards Acute & Chronic: INHALATION: MAY CAUSE NOSE & THROAT IRRITATION. EYES: MAY CAUSE IRRITATION. SKIN/SKIN ABSORPTION: MAY CAUSE IRRITATION. INGESTION: HARMFUL TO STOMACH IN LARGE DOSES.

Signs & Symptoms of Overexposure:
IRRITATION.

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: N/P
Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcinogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

First Aid:

EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS. SKIN: WASH W/SOAP & WATER.
INHALATION: REMOVE TO FRESH AIR. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Fire Fighting Procedures:

NONE

Unusual Fire or Explosion Hazard:

GIVES OFF CO2 AT 122F & SODIUM CARBONATE, ANHYDROUS AT 212F.

Extinguishing Media:

WATER.

Flash Point: Flash Point Text: NON-FLAMMABLE

Autoignition Temperature:

Autoignition Temperature Text: N/A

Lower Limit(s): N/K

Upper Limit(s): N/K

Section 6 - Accidental Release Measures
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Spill Release Procedures:

SWEEP UP & CONTAINERIZE FOR DISPOSAL. FLUSH AREA W/WATER & NEUTRALIZE.
PREPARED BUFFER SOLUTION: NEUTRALIZE & WASH AREA W/COLD WATER.

Section 7 - Handling and Storage
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Handling and Storage Precautions:**Other Precautions:**

Section 8 - Exposure Controls & Personal Protection
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Respiratory Protection:

N/K

Ventilation:

N/K

Protective Gloves:

N/K

Eye Protection: N/K

Other Protective Equipment: N/K

Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.

Supplemental Health & Safety Information: TRADE NAME CONT'D: CARBONATE
HYDROGEN. SOLUBILITY IN WATER: SOLUBLE IN 10 PARTS WATER AT 77F.

Section 9 - Physical & Chemical Properties
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

HCC:

NRC/State License Number:

Net Property Weight for Ammo:

Boiling Point: Boiling Point Text: N/K

Melting/Freezing Point: Melting/Freezing Text: 518F

Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K Vapor Density: N/K
Percent Volatile Organic Content:
Specific Gravity: 2.16
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: (SEE SUPP)
Appearance and Odor: WHITE CRYSTALLINE/GRANULAR POWDER W/NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Stability Indicator: YES
Materials to Avoid:
ACIDS, AMMONIUM PHOSPHATE MONOBASIC.
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
CO, CO₂ & SODIUM CARBONATE, ANHYDROUS.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NONE

Section 11 - Toxicological Information
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Toxicological Information:
N/P

Section 12 - Ecological Information
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Ecological Information:
N/P

Section 13 - Disposal Considerations
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Waste Disposal Methods:
DISPOSE OF THROUGH APPROVED WASTE SITE/WASTE TREATMENT PLANT IAW/FEDERAL,
STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Transport Information:
N/P

Section 15 - Regulatory Information
SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

SARA Title III Information:
N/P

Federal Regulatory Information:

N/P

State Regulatory Information:

N/P

Section 16 - Other Information

SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

Other Information:

N/P

HAZCOM Label Information

Product Identification: SODIUM BICARBONATE,BAKING SODA,SODIUM ACID CARBONATE (SUPP)

CAGE: 29907

Assigned Individual: N

Company Name: OMEGA ENGINEERING INC.

Company PO Box: 4047

Company Street Address1: ONE OMEGA DRIVE

Company Street Address2: STAMFORD, CT 06907-0047 US

Health Emergency Telephone: 203-359-1660/800-255-3924

Label Required Indicator: Y

Date Label Reviewed: 10/12/1999

Status Code: A

Manufacturer's Label Number:

Date of Label:

Year Procured: N/K

Organization Code: G

Chronic Hazard Indicator: N/P

Eye Protection Indicator: N/P

Skin Protection Indicator: N/P

Respiratory Protection Indicator: N/P

Signal Word: N/P

Health Hazard:

Contact Hazard:

Fire Hazard:

Reactivity Hazard:

NOTES

