

MEDICAL UNIVERSITY OF SOUTH CAROLINA (MUSC)
HAZARD COMMUNICATION PROGRAM

Revised: 9/2007

PERFORMANCE IMPROVEMENT FOR
HAZARDOUS MATERIALS LABELING

I. Purpose of the Hazard Communication Program

- A. The objective of our hazard communication program is to assure that:
1. Every chemical used at MUSC is evaluated with regard to potential physical and health hazards.
 2. Information regarding potential hazard(s) of chemicals used at MUSC is transmitted to employees and appropriate contractors.
 3. Employees are notified with respect to potential hazard(s) resulting from our operations and investigative activities.

II. OSHA Hazard Communication Standard

- B. In August 1987, the United States Department of Labor, through its Occupational Safety and Health Administration (OSHA), revised its standard for communicating potential health and physical hazards to employees, contractors, and customers, to cover all employees exposed to hazardous chemicals in their work places. This standard has applied to the Medical University of South Carolina since May of 1988. Main requirements of the standard are:
1. Hazard Determination
 - a. Chemical manufacturers must determine both health and physical hazards of the materials they produce.
 2. Inventories of hazardous materials are maintained on each unit in medical center buildings.
 3. Material Safety Data Sheets (MSDS's)
 - a. The producer of a hazardous material must prepare an MSDS for the material, supply the customer a copy of the MSDS with the first shipment, and update the MSDS as needed.
 - b. Employees and contractors using, handling, or storing the chemical at the customer's site must be given the information contained in the MSDS as part of a training program. The MSDS must be readily available to employees and contractors for review.
 - c. The standard requires that the MSDS provide:

- (1) The specific chemical identity of the material
- (2) The physical and chemical characteristics
- (3) The physical hazards
- (4) The health hazards, including signs and symptoms of exposure, and medical conditions generally recognized as being aggravated by exposure to the chemical
- (5) The primary routes of exposure, for example inhalation, ingestion or absorption.
- (6) The OSHA or other exposure limit used or recommended by the MSDS author
- (7) Whether the chemical is a known carcinogen
- (8) The generally applicable precautions for safe handling and use of the chemical
- (9) Emergency and first aid procedures
- (10) The date of preparation or latest revision
- (11) The name, address, and telephone number of a person who can give additional information and appropriate emergency procedures if needed

4. Labels and warnings

- (1) All containers of hazardous chemicals which are shipped must be labeled to reflect the identity, the hazard warning, and the name and address of the chemical manufacturer.
- (2) Containers of hazardous chemicals in the work-place, except pipes and piping systems and portable containers whose contents are to be used by one person within the same shift, must be labeled as to identity using the full chemical name (acetone) and with appropriate hazard warning (flammable). 704 Stickers may be used to identify the appropriate hazard warning.

5. Training

- a. Departments must establish and implement training for employees potentially exposed to a hazardous chemical. The training must include:
 - (1) How the hazard communication program is implemented.
 - (2) How to read and interpret information on labels and in an MSDS.
 - (3) How to obtain and use the available hazard information.
 - (4) The hazards of chemicals in the employee's work area.

- (5) The measures the employee can take for protection against the hazards.
 - (6) Specific procedures put into effect by the employers to provide protection such as work practices and the use of personal protective equipment.
 - (7) Methods and observations, such as visual appearance or smell, which a worker can use to detect the presence of a hazardous chemical to which he or she may be exposed.
- b. Copies of OSHA's Hazard Communication Standard are kept by the OSHP office or by calling 843-792-3604 and can be accessed through www.osha.gov. The standard is available for employee review at any time. MUSC'S Hazard Communication Program is located in the Green Safety Manual and Occupational Safety and Health Programs Internet Site.

III. Hazard Determination Procedure

- A. Chemicals mixed for on-site use must be evaluated to determine if they are hazardous. If a chemical is determined to have a physical or health hazard, a material safety data sheet must be prepared, and the hazard identified.
- B. The following procedure is used to evaluate the hazards of a chemical:
1. Determination of Physical Hazards
 - a. The department mixing or using the chemical researches relevant available literature, including published as well as internal information.
 - (1) Sources consulted in evaluating hazards of chemicals
 - (a) 29 CFR Part 1910, Subpart Z
 - (b) "Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, American Conference of Governmental Industrial Hygienists, current edition.
 - (c) "Workplace Environmental Exposure Level Guides," American Industrial Hygiene Association.
 - (d) "Annual Report on Carcinogens," National Toxicology Program.
 - (e) Monographs, International Agency for Research on Cancer.

- (2) Sources which may be consulted in hazard evaluation
 - (a) Tests conducted in hazard evaluation.
 - (b) Test data from other sources (manufacturers, laboratories, etc.).
 - (c) Commercial databases and standard tests and handbooks (see Appendix C to 29 CFR 1910.1200 for a list of available sources).
 - (d) MSDS's from other manufacturers.
- b. The information is studied to determine significant physical hazards of the chemical.

2. Determination of Health Hazards

- a. The chemical is submitted to the responsible health professionals in the department producing the material for evaluation of possible health hazards* and aquatic toxicity.
- b. Relevant available literature including published and internal information is compiled.
- c. Toxicological and medical literature is reviewed and data from scientifically valid studies evaluated for hazard information.
- d. The evaluating health professionals report their conclusions to the Department.

*Health hazards are determined according to the definitions and criteria set forth in Appendices A and B to CFR 1910.1200 (copy available at Occupational Safety and Health Programs for review).

IV. Hazardous Material Inventories

Each manager is responsible for the development and maintenance of a hazardous materials inventory list which will identify all of the hazardous materials located within their work area. The manager will be responsible for updating the list. OSHP will perform an audit annually to ensure inventories are available and current. Discrepancies will be sent to the manager and reported to the EOC committee.

V. Use of Material Safety Data Sheets

- A. Before a chemical or mixture of chemicals is approved for use at the Medical University of South Carolina, a material safety data sheet (MSDS) for the chemical or mixture must

be in place. For a purchased material, The MSDS is obtained from the manufacturer or vendor; a material generated on site is covered by an MSDS developed here. An MSDS obtained from a manufacturer or vendor may be modified if the information as received is incorrect or incomplete.

- B. The MSDS gives all the information required by the Hazard Communication Standard including:
 - 1. Identity of the hazardous components of the material.
 - 2. The health and physical hazards of the material.
 - 3. Protective measures and equipment to be used if potentially exposed to the material.
- C. The MSDS provides the means for making the system a useful tool for determining if a chemical is hazardous, precautions to be taken when using/handling/storing, protective equipment to be used, method for disposal, who to contact for more information, etc
- D. MSDS's for all chemicals and mixtures used or produced for continuing use at the Medical University of South Carolina are maintained at the OSHP. Each area using, handling, or storing the material has access to the MSDS through a computer terminal located in the area, and accessible to all employees assigned to the area. Hard copies are obtained from OSHP.
- E. To retrieve MSDS Occupational Safety and Health Programs web page follow the steps below:
 - 1. Click on Web Browser.
 - 2. Click on Administration in black tool bar.
 - 3. Click on Risk Management/OSHA.
 - 4. Click on Occupational Safety in blue tool bar.
 - 5. Click on Material Safety Data Sheets.
 - 6. Type in name of hazardous chemical.
 - 7. View from screen or print for future use.

Complete form and click send

- F. Emergency MSDS's are available 24-hours a day by calling the Engineering & Facilities Trouble Desk at 4119. Your printout can be picked up at Energy Management/Service Call Desk, on the 2nd floor of Rutledge Tower.

VI Container Labeling

- A. All chemical containers in the work place (except portable containers, whose contents

are used by one person within the same shift) must be labeled as to identify the contents (using the full chemical name), and a warning of any potential hazard or hazards. 704 stickers may be used to identify potential hazards of the material.

VII Training

- A. All Medical University of South Carolina Hospital employees are given training in the general requirements of the Hazard Communication Standard. Employees assigned to jobs requiring routine use or handling of potentially hazardous chemicals are given additional training by their supervisors with emphasis on health and/or physical hazards of the specific chemical. Employees performing non-routine tasks with potential for exposure to a hazardous material are given special training by their supervisors in dealing with the particular hazard.
- B. Types of Training
 - 1. General Training is offered as part of new employee orientation. Employees are required to receive this training before starting work and on an annual basis.
 - a. Covers requirements of the Hazard Communication Standard, MSDS information, location of the written Hazard Communication Program and of MSDS's and procedures for retrieving MSDS's through Internet.
 - b. Carried out in new employee orientation via audiovisual training aids and lecture.
 - 2. Training of employees who use/handle hazardous chemicals routinely. This training is performed annually.
 - a. Emphasizes potential hazards of chemicals likely encountered in the job assignment.
 - b. Covers job procedures, hazard summaries, spill procedures.
 - c. Given by supervisors to small groups or to individuals.
 - 3. Training of employees involved in unusual jobs
 - a. Limited to a few employees who are specialists in performing the particular job.
 - b. Jobs are done infrequently; details reviewed and potential problems addressed each time before starting the job.
 - c. Given by supervisors to small groups or to individuals.

4. Training of employees newly assigned to job
 - a. Before assuming job responsibilities, a new employee (just hired or transferred from another work area) is given, through training regarding, the potential hazards associated with the job.
 - b. The training consists of both general training and specific training with respect to the hazardous chemicals likely to be encountered while performing the job.
 - c. This training is given by supervisors to small groups or to individuals
 - d. Annual inspections are performed to evaluate employee knowledge and compliance.
5. Training of contractors
 - a. The Site Contract Coordinator and Contractor Supervisor inform contract employees of known hazards that may be encountered during the course of the job and how to use the MSDS system.
 - b. Given by supervisor.
6. New Hazardous Chemicals
 - a. Before a hazardous chemical previously unused in an area is put into service, all employees assigned to the area are instructed on the hazards of the materials.

VIII Monitoring for Airborne Chemicals

- A. The airborne concentration of chemicals listed in OSHA's Z Table is determined routinely in the work areas of the Medical University of South Carolina.
 - a. Personnel monitoring samples and/or area (fixed location) samples are collected and analyzed.
 - b. The jobs monitored, and locations that are sampled were chosen on the basis of those with the greatest potential for employee exposure.
 - c. Potential exposure levels for other chemicals used or produced in the various locations are determined as needed.
 - d. Monitoring results are reported to the area sampled and to all employees assigned to the job or, if appropriate, to the area. Results are maintained in the University Safety Office.

IX Hazard Communication to Contractors

- A. All contractors who perform work at Medical University of South Carolina are provided with information about hazardous materials, which may be encountered by the Site Contract Coordinator with, input as necessary from the area(s) involved.
- B. Before starting the job, the contractor is advised:
 - 1. That he must conform to safety practices necessary to protect his employees and Medical University of South Carolina employees from exposure to hazards from the job.
 - 2. Of unusual hazardous situations recognized by Medical University of South Carolina and unique to site operations, and of protective equipment, procedures, and/or safety rules used or followed if the job is done by Engineering & Facilities personnel.
 - 3. That chemicals may be brought on the site only after an MSDS is obtained and reviewed by University Safety Office.
 - 4. That his employees must be acquainted with the location and the contents of MSDS's for all chemicals used in performing the job.
 - 5. That he must inform the Site Contract Coordinator of any activity which may adversely affect the safety and health of Medical University of South Carolina employees.
 - 6. That the Medical University of South Carolina labeling system requires that containers be labeled as to identify and with the appropriate hazard warning.

X. Access to Hazard Information

Departments access material safety data sheets by accessing the University's main frame computer. Additionally, University Safety maintains a file of material safety data sheets and will provide copies upon request. Any questions concerning interpretation of information contained on material safety data sheets should be directed to University Safety at 908 Harborview Towers.

XI Permissible Exposure Limits

The following chemicals are regulated by the Occupational Safety and Health Administration. OSHA has not established permissible exposure levels for the chemicals below, however, University Safety will assist in setting up safe work and storage practices if employees are working with any of these chemicals.

Nitrobiphenyl
 alpha-Naphthylamine
 4,4'-Methylene 'bis (2-chloroaniline)
 3,3'-Dichlorobenzidine (and its salts)
 bis-Chloromethyl ether
 beta-Naphthylamine
 Benzidine
 4-Aminodephenyl
 Ethyleneimine
 beta-Propiolactone
 Acetylaminofluorene
 N-Nitrosodimethylamine

Substances identified by OSHA as suspected and confirmed human carcinogens, with permissible exposure levels.

| <u>Substance</u> | <u>(CAS #)</u> | <u>ppm</u> | <u>mg/m3</u> |
|------------------------------|------------------|------------|--------------|
| Acetaldehyde | (75-07-0) | 100 | 180 |
| **Acrylamide | (79-06-1)-Skin - | | 0.03 |
| **Acrylonitrile | (107-13-1)-Skin | 1 | - |
| Aldrin | (309-00-2)-Skin | - | 0.15 |
| Allyl chloride | (107-5-1) | 1 | 3 |
| Amitrole | (61-82-5) | - | 0.2 |
| Aniline & homologues-Skin | (62-53-3) | 2 | 10 |
| Anisidine | (29191-52-4) | 0.1 | 0.5 |
| (o-,p-isomers)-Skin | | | |
| **Antimony trioxide | (1309-64-4) | - | 0.5 |
| Handling and use, as SB | | | |
| **Production | | - | - |
| Arsenic | (7440-38-2) | - | 0.2 |
| & soluble compounds, as | | | |
| Asbestos 0.2 fiber/cc | | | |
| **Benzene | (71-43-2) | 0.1 | 0.32 |
| **Benzo(a)pyrene | (50-32-8) | - | - |
| Benzyl chloride | (100-44-7) | 1 | 5 |
| **Beryllium and compounds | (7440-41-7) | - | 0.0005 |
| **1,3-Butadiene | (106-99-0) | 10 | 22 |
| <u>Substance</u> | <u>(CAS #)</u> | <u>ppm</u> | <u>mg/m3</u> |
| Cadmium dusts & salts, as Cd | (7440-43-9) | - | (0.05) |
| Carbon black | (1333-86-4) | - | 3.5 |
| **Carbon tetrachloride | (56-23-5)-Skin 2 | | 12.6 |
| Chlordane | (57-74-9)-Skin - | | 0.5 |
| Chlorinated camphene | (8001-35-2)-Skin | - | 0.5 |
| Chlorodifluoromethane | (75-45-6) | 1000 | 3500 |

| <u>Substance</u> | <u>(CAS #)</u> | <u>ppm</u> | <u>mg/m3</u> |
|--|--------------------|------------|--------------|
| Chlorodiphenyl (54% Chlorine) | (11097-69-1)-Skin | | 0.5 |
| **Chloroform | (67-66-3) | 2 | 9.78 |
| Bis (chloromethyl) ether | | 0.001 | 0.005 |
| **Chloromethyl methyl ether | (107-30-2) | - | - |
| B-Chloroprene | (126-99-8)-Skin | 10 | 35 |
| *Chromite ore processing (Chromate), as Cr | - | | 0.05 |
| Chromium (VI) compounds, as Cr | | | |
| Water soluble | | - | 0.05 |
| *Certain water insoluble | | - | 0.05 |
| Chromyl chloride | (14977-61-8) - | | 0.05 |
| **Chrysene | (218-01-9) | - | - |
| *Coal tar pitch volatiles as benzene solubles | (65996-93-2) | - | 0.2 |
| Cobalt | (7440-48-4) | - | 0.05 |
| As Co Metal dust & fume | | | |
| Crotonaldehyde | (4170-30-3) | 2 | 6 |
| DDT (Dichlorodiphenyl-trichloromethane) | (50-29-3) | - | 0.5 |
| Diazomethane | (334-88-3) | 0.2 | 0.4 |
| Dichloroacetylene | (7572-29-4) | 0.1 | 0.4 |
| **3,3'-Dichlorobenzidine | (91-94-1)-Skin | - | - |
| Dichloropropene | (542-75-6)-Skin | 1 | 5 |
| Diglycidyl ether (DGE) | (2238-07-5) | 0.1 | 0.5 |
| **Dimethyl carbamoyl chloride | (79-44-7) | - | - |
| **1,1-Dimethylhydrazine | (57-14-7) | 0.5 | 1 |
| **Dimethyl sulfate | (77-78-1)-Skin | 0.1 | 0.5 |
| Dinitrotoluene | (121-14-2)-Skin | - | 1.5 |
| Dioxane | (123-91-1)-Skin | 25 | 90 |
| Di-sec-octyl phthalate | (117-81-7) | - | 5 |
| Epichlorohydrin | (106-89-8) | 2 | 8 |
| **Ethylene dibromide | (106-93-4)-Skin | 0.045 | 0.38 |
| Ethylene oxide | (107-06-2) | 1 | 4 |
| Ethylenimine | (151-56-4)-Skin | 0.5 | 1 |
| **Formaldehyde | (50-00-0) | 1 | 1.5 |
| Heptachlor | (76-44-8)-Skin | - | 0.5 |
| **Hexachlorobutadiene | (87-68-3)-Skin | - | - |
| **Hexamethyl phosphoramidate | (680-31-9)-Skin | - | - |
| **Hydrazine | (302-01-2)-Skin | 0.1 | 0.1 |
| Lead arsenate | (3687-31-8) | - | 0.15 |
| As Pb3 (AsO4)2 | | | |
| **Lead chromate | (7758-97-6), as Cr | - | 0.05 |
| Lindane | (58-89-9)-Skin | - | 0.5 |
| Methyl bromide | (74-83-9)-Skin | 5 | 20 |
| Methyl chloride | (74-87-3) | 50 | 105 |
| **4,methylene bis (2-chloroaniline) | (101-14-4) Skin | 0.02 | 0.22 |

| <u>Substance</u> | <u>(CAS #)</u> | <u>ppm</u> | <u>mg/m3</u> |
|--|--|------------|--------------|
| **Methyl hydrazine | (60-34-4)-Skin | 0.2 | 0.35 |
| **Methyl iodide | (74-88-4)-Skin | 2 | 10 |
| Nickel | (7440-02-0) | | |
| Metal | | - | 1 |
| Insoluble compounds, as Ni | | - | 1 |
| Soluble compounds, as Ni | | - | 0.1 |
| Nickel carbonyl | (13463-39-3) | 0.001 | 0.1 |
| as Ni | | | |
| *Nickel sulfide roasting, fume & dust, as Ni | | - | 1 |
| *4-Nitrodiphenyl | (92-93-3) | - | - |
| **2-Nitropropane | (79-46-9) | 10 | 35 |
| **Nitrosodimethylamine | (62-75-9)-Skin | - | - |
| **N-Phenyl-beta-naphthyl-amine | (135-88-6) | - | - |
| Phenyl glycidyl ether (PGE) | (122-60-1) | 1 | 6 |
| **Phenylhydrazine | (100-63-0)-Skin | 5 | 20 |
| **Propane sultone | (1120-71-4) | - | - |
| **B-Propiolactone | (57-57-8) | 0.5 | 1.5 |
| **Propylene imine | (75-55-8)-Skin | 2 | 5 |
| Propylene oxide | (75-56-9) | 20 | 50 |
| 1,1,2,2-Tetrachloroethane | (79-34-5)-Skin | 1 | 7 |
| **0-Toluidine | (119-93-7)-Skin | - | - |
| **0-Toluidine | (95-53-4)-Skin | 2 | 9 |
| 1,1,2-Trichloromethane | (79-01-6) | 10 | 45 |
| Trichloroethylene | (79-01-6) | 50 | 270 |
| **Vinyl bromide | (593-60-2) | 5 | 20 |
| *Vinyl chloride | (75-01-4) | 0.5 | 10 |
| Vinylidene chloride | (75-35-4) | 1 | 4 |
| Wood dust (certain hard woods as beech/oak) | | - | 1 |
| Soft wood - 5 | | | |
| *Zinc chromates | (13520-65-9; 11103-86-9; 37300-23-5), as Cr | - | 0.01 |

*Confirmed Human Carcinogen

**Suspected Human Carcinogen