

Carnegie Mellon University

Hazard Communication Program

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Carnegie Mellon University
Hazard Communication Program

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1. Introduction

1.1 Purpose

The Carnegie Mellon University (CMU) Hazard Communication Program (HCP) is designed to provide accurate, up-to-date information and appropriate training for all employees who use hazardous chemicals on-site. This written Hazard Communication Program describes the procedures used to convey information about hazardous chemicals and meets or exceeds the requirements of 29 CFR 1910.1200, OSHA's (Occupational Safety and Health Administration) Hazard Communication Standard.

1.2 Policy

It is the policy of Carnegie Mellon University to ensure that employees are aware of the physical and health hazards associated with chemicals in their work area, and of the procedures for their safe handling and use.

1.3 Scope

The Hazard Communication Program applies to all *non-laboratory* employees at Carnegie Mellon University. Note that *Laboratory* employee use of hazardous materials is addressed in the Carnegie Mellon Chemical Hygiene Plan.

Personnel whose use of hazardous chemicals is limited to consumer products, used in the same manner as a consumer would, are NOT addressed by the Hazard Communication Program.

Certain provisions of this program are not applicable to employees whose use of hazardous chemicals consists only of handling closed containers. The sections on labeling, MSDS (Material Safety Data Sheets), and training (to the extent that they may protect themselves in the event of a leak or spill) **ARE** applicable in this circumstance.

1.4 Availability of the Program

This written program is available to all employees of Carnegie Mellon University who work with hazardous chemicals. A written copy shall be accessible at each work site. An electronic copy is accessible from any Carnegie Mellon computer terminal at the Environmental Health and Safety (EH&S) web site: <http://www.cmu.edu/ehs/chemical/HazCommProgram.pdf>

1.5 Managing and Updating the Program

The Assistant Director of EH&S is responsible for the preparation and regular updating of the HCP.

2. Responsibilities

2.1 University Administration

University administration is responsible for providing executive support for the University's HCP by ensuring that there are sufficient monetary and personnel resources to administer the HCP.

2.2 Area Manager, Supervisor or Department Head

The Area Managers, supervisors or department heads (or their designees) are responsible for:

- Determining whether there are hazardous chemicals present in their work areas (EH&S is available to assist in this determination).
- Ensuring that chemical inventories are prepared for each area of their responsibility.
- Ensuring that the inventories are updated at least yearly in the format provided by EH&S.
- Ensuring that the inventory is accessible in the applicable work area either by posting or by on-line availability.
- Ensuring that all employees within their jurisdiction who work with hazardous chemicals receive training according to the requirements of the OSHA Hazard Communication Standard.
- Ensuring that a new chemical is evaluated for its potential effect as a hazardous chemical before use (EH&S is available to assist in this function).
- Ensuring that for every hazardous material present, an MSDS/SDS is available for review by employees at the work area, either in a paper copy or via computer.
- Ensuring that all chemical containers are labeled according to the requirements of the OSHA Hazard Communication standard.
- Ensuring that that information (and training where appropriate) on chemical hazards present in the work area is provided to service contractors or maintenance personnel, as well as to visitors, where appropriate.

2.3 Environmental Health and Safety (EH&S)

EH&S personnel are responsible for:

- Assisting area managers, supervisors and department heads in the determination of the presence of a hazardous chemical in a given workplace.
- Assisting area managers, supervisors and department heads in the evaluation of new chemicals proposed for purchase.
- Providing a framework for the creation and maintenance of a University-wide chemical inventory.
- Providing information for chemical users to obtain Material Safety Data Sheets/Safety Data Sheets, including through internet resources.
- Performing hazard communication training for employees according to the OSHA Standard Requirements.
- Preparing and updating the University's written program on the Hazard Communication Standard, and any related documents and/or policies.

- Coordinating any response or interaction with OSHA regarding hazard communications.
- Auditing the Hazard Communication Standard compliance of individual work areas as is deemed necessary.

2.4 Employees Using Hazardous Chemicals

All employees using hazardous chemicals in their work areas are responsible for:

- Receiving OSHA hazard communications training.
- Following the procedures specified for the use and handling of hazardous materials, including storage, transport, labeling, protective equipment, etc.
- Knowing the location of the:
 1. Written Hazard Communication Plan,
 2. Chemical Inventory for their work area,
 3. Material Safety Data Sheets (MSDS) for the hazardous chemicals with which they work.
- Understanding the health hazards of the hazardous chemicals with which they work.

3. Hazardous Materials Location and Inventory

3.1 Defining Hazardous Materials

Hazardous materials shall be defined as either a health hazard or a physical hazard (or both).

“Health hazard” means a chemical for which there is 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 chemical which are carcinogenic, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, or agents which damage the lungs, skin, eyes, mucous membranes, liver, kidneys or other target organs.

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

Carnegie Mellon University will rely on the hazard determinations made by the manufacturers of the chemicals that are used on-site. This hazard information is available from labels and MSDS. For by-products and intermediates produced on site, standard reference texts, toxicological databases, and the OSHA Hazard Communication Standard will be used to identify any hazards and to prepare appropriate labels. EH&S will coordinate these efforts along with the appropriate user.

3.2 Listing of sites with hazardous materials present (this list is not exhaustive)

The following areas of the University have hazardous materials present (note that laboratories are not included in this listing):

- Facilities Management Services
- Housing Services
- College of Fine Arts: (Art, Drama, Design, Architecture, etc.)
- Photographic development areas
- Robotics
- Integrated Innovation Institute (III)
- ASTM Warehouse services
- Athletics
- Printing, Copying and Publication Services
- Student Health Services
- Maker Spaces (laser cutters, 3D printers, soldering, etc.)
- Groups with facility managers or coordinators who may handle hazardous materials

*[Note that custodial and dining services are **not** performed by Carnegie Mellon employees]*

3.3 Inventory Information

An inventory of hazardous chemicals present in each work area is to be prepared under the direction of the area supervisor, manager or department head. Chemical inventories should be created and updated in the university's Chemtracker system, accessible from the EH&S web site:

<http://www.cmu.edu/ehs/chemical/chemtracker.html>

The inventory of hazardous chemicals for each work area:

- Must be accessible to all employees during their work shift, either through electronic or paper means.
- Should be updated as changes are made.
- Should be submitted to EH&S upon preparation and after each update.

4. Labels and Warnings

4.1 Labeling systems in use

For incoming materials, Carnegie Mellon University relies on the manufacturer's label, providing it meets the requirements of the current Hazard Communication Standard. This label will have the following information present:

- The identity of the hazardous chemicals contained.
- Appropriate hazard warnings that provide at least general information regarding the hazards of the chemicals.
- The name, address of the chemical manufacturer.

Products with labels not meeting this requirement will either be returned to the manufacturer or relabeled properly. It is strongly encouraged that all employees order materials from manufacturers with compliant labels.

A secondary container is one to which the hazardous materials have been transferred from their original containers. All secondary container labels must have the following information present:

- The identity of the hazardous chemicals contained
- Appropriate hazard warnings that provide at least general information regarding the hazards of the chemicals

The NFPA (National Fire Protection Agency) system of a warning diamond has been used for many years, is very common on campus, and our employees are used to understanding it. The NFPA graphic is a diamond, divided into four smaller diamonds of different colors. The blue, red and yellow portions address the hazards due to flammability, health effects, and reactivity, respectively. In each portion, a numerical rating is given, on a scale from 0 to 4, for the material in the container. The lower the number is, the less the hazard in that particular classification. In the white portion, additional hazards are addressed, with a self-evident graphic, indicating, for example, water reactivity, biohazard, a respirator requirement, etc.

Note that the presence of the NFPA graphic indicates the hazard of the particular material only; the other label requirements [see 4.2 (b), below] must still be on the label as well. **EH&S will assist in the preparation of any secondary container labels needed by the university. Frequently, the information needed for the completion of the label information may be obtained from the MSDS for the material.**

4.2 Label requirements and procedures

4.2.1 Manufacturer-supplied labels shall not be removed or defaced except under the following conditions:

- The label does not meet the requirements of the standard.
- The container has been emptied and will either be disposed of or used for a different material.

4.2.2 The OSHA Hazard Communication Standard requires that labels for secondary containers display at least the following information:

- The identity of the hazardous material(s).
- Appropriate hazard warnings (i.e., text, pictures, symbols or any combination that provides at least general information regarding the hazards of the chemical and which, in conjunction with the other information immediately available to employees, will provide specific information regarding the physical and health hazards of the material).

- 4.2.3 Signs, placards, or other written materials may be used when labels are impractical for an *individual stationary process container* (such as a tank or pipe) as long as they supply the same information as a label.
- 4.2.4 Containers into which hazardous materials are transferred (on campus) must be labeled according to the specifications in (4.2.2) above, with the exception of containers that are intended only for the immediate use of the employee performing the transfer. For the purposes of this standard, “immediate use” means a container that will always be under the control of and used only by the person who performs the transfer and only within the work shift in which it is transferred.
- 4.2.5 The contents of any unlabeled containers may be sampled and analyzed at the “owning” department’s expense to determine the identity of the material(s) in the container.
- 4.2.6 In the event in a change in the hazard information, it is the responsibility of the area supervisor, manager or department head to ensure that updated label information be present on a container label. When an updated MSDS is received, it must be reviewed to determine the need for different labeling information. EH&S is available for assistance with this task.

4.3 Global Harmonization Labels and Pictograms

- 4.3.1 Beginning in March of 2012, with the adoption by OSHA of the Global Harmonization System of warnings, additional graphics will also be found on manufacturer’s labels. Training includes the description of these new symbols and a Fact Sheet is also available on the EH&S web site to assist in understanding them:

<http://www.cmu.edu/ehs/fact-sheets/ghs-pictograms.pdf>

This fact sheet is included as an appendix to this document.

- 4.3.2 The university has adopted these new pictograms as a requirement for chemical labels, including on secondary containers. Figure 1 identifies the new pictograms:

Figure 1: Pictograms and Hazards

<p>Health Hazard</p>  <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 	<p>Flame</p>  <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides 	<p>Exclamation Mark</p>  <ul style="list-style-type: none"> • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
<p>Gas Cylinder</p>  <ul style="list-style-type: none"> • Gases Under Pressure 	<p>Corrosion</p>  <ul style="list-style-type: none"> • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals 	<p>Exploding Bomb</p>  <ul style="list-style-type: none"> • Explosives • Self-Reactives • Organic Peroxides
<p>Flame Over Circle</p>  <ul style="list-style-type: none"> • Oxidizers 	<p>Environment (Non-Mandatory)</p>  <ul style="list-style-type: none"> • Aquatic Toxicity 	<p>Skull and Crossbones</p>  <ul style="list-style-type: none"> • Acute Toxicity (fatal or toxic)

5. Material Safety Data Sheets

5.1 MSDS requirements and procedures

A Material Safety Data Sheet (MSDS) is required to be available to employees in their work area, for every hazardous chemical in the area's inventory. It is the responsibility of the area manager, supervisor or department head to ensure that this requirement is met. No chemical may be used on-site unless the MSDS has been received and is available in the work area in which the chemical is to be used. If no MSDS is present, one of the following must be performed to obtain one:

- Contact the manufacturer and request an MSDS.
- Go to the EH&S web site and view or print an MSDS from the database there (look at the top of the main EH&S page and select the “MSDS” link.)
- From an internet search engine, locate an MSDS for a material (by searching for the name of the material and the phrase “MSDS”).

If no MSDS is available, the product must be returned to the manufacturer. Contact EH&S at 8-8182 to ensure that any shipment of hazardous materials is performed properly.

All MSDS used in the University must meet the requirements outlined in the Hazard Communication Standard, 29 CFR 1910.1200 (g)(2). Any MSDS not meeting this requirement must be removed from the work site. Note: MSDSs in the format labeled “OSHA Form 20” are *not* acceptable.

The area supervisor, manager or department head is responsible to ensure that only the current MSDS is placed in the active file or book. All outdated MSDS must be removed from circulation.

It is recommended that the MSDS be present in hard copy format in each work area, although it is permitted to meet this requirement through MSDSs available on the CMU web page. The format and mechanism of the availability of MSDSs is left to the discretion of the area manager, supervisor or department head. The most current version of the MSDS shall be retained.

MSDS shall be accessible in each work area where the hazardous chemical is used.

With the adoption of the Global Harmonization System, there will also be changes in hazard ratings and rankings. These new ratings and ranking will be found on the MSDS. A fact sheet has been prepared to explain the new system and is available at:

<http://www.cmu.edu/ehs/fact-sheets/msds-hazard-identification-systems.pdf>

Note that the terminology “Material Safety Data Sheet” or “MSDS” has been changed slightly with the adoption of the Global Harmonization System. The document is not correctly called a “Safety Data Sheet” or “SDS”. Given the still-widespread use and familiarity of the term MSDS, this document continues to use it, though the names are now interchangeable.

5.2 Accessing MSDS on the EH&S Website

- 5.2.1 Go to EH&S home web page (www.cmu.edu/ehs)
- 5.2.2 Select “MSDS”
- 5.2.3 You will see a link to “MSDSOnline”; click on it. You will need to log in with your Andrew ID. Then you can search the database for your material(s).
Contact EH&S at 8-8182 for assistance, if needed.
- 5.2.4

5.3 Global Harmonization updates 2012

- 5.3.1 In the OSHA 2012 update to the Hazard Communication regulation, there is a terminology change: Materials Safety Data Sheets (MSDS) are now referred to as Safety Data Sheets (SDS). It is expected that both terms will be used interchangeably during the phase in period of the regulatory changes.
- 5.3.2 There is a more standard sixteen section format for the SDS as well. The changes include re-ordering the required items from the former formats and also the addition of the new pictograms (noted above) and new hazard ratings.
- 5.3.3 There has been a fact sheet prepared (in the appendix section of this document) which outlines the rating system for the various categories of hazards. It is also located here:

<http://www.cmu.edu/ehs/fact-sheets/msds-hazard-identification-systems.pdf>

6. Employee Information and Training

6.1 Training Policy and Requirements

Carnegie Mellon provides training to all persons handling or using hazardous chemicals. This training will be performed at initial assignment and again when a new hazard is introduced into the workplace. The initial training will be performed by the EH&S department and will be documented by them. It is the responsibility of the area supervisor to ensure that employees attend training when it is necessary.

6.2 Training Specifications

Hazard Communication training shall address the following topics:

- Description of the OSHA Standard.
- How to read MSDS and where they are located in the employee's work area
- How to read container labels.
- Where the inventory is located in the employee's work area and where the hazardous materials are located or being used in the area.
- Where to locate a copy of the written Hazard Communication Plan and the OSHA standard.
- Specific information on the chemical the employee will work with, such as possible health or physical hazards (and how to detect them), ways to protect oneself from exposure, use of protective equipment or engineering controls, and emergency response procedures.
- The details of the Global Harmonization System changes, including new pictograms and the new hazard rating system.

7. Contractor/Visitor Information

7.1 Contractor Procedures

The area manager, supervisor or department head is responsible for conveying hazard information to all contractors working in their area(s).

Specific information that must be provided to contractors includes:

- Either the MSDS or the location of the MSDS for the material(s) which they may come in contact with.
- Instruction in the use of the labeling systems present in the area.
- Instruction in the proper handling procedures for any hazardous material(s) present in the area, where applicable.
- Instruction in the use of any protective equipment or engineering controls used when handling the material(s), if applicable.
- Instruction in the emergency response procedures, such as for fire, explosion, chemical leak, chemical exposure or health problem.

7.2 Visitor Procedures

For the protection of visitors present in areas where hazardous chemicals are stored or used, information must be given on these chemicals appropriate to the potential for exposure. The area manager, supervisor or department head is responsible for providing this information. The potential for exposure is dependent on whether the visitor is escorted or not, and the types and quantities of hazardous materials present. Escorted visitors with little or no potential for exposure need only receive basic warning information. Unescorted visitors should follow the requirements for contractors (section 7.1) where there is potential for exposure to hazardous chemicals.

8. References

- A. 29 CFR 1910.1200, The Hazard Communication Standard, see link below:
- B. *Chemical Hygiene Plan* (CMU written document addressing laboratory exposures)
- C. *Radiation Safety Plan* (CMU written document addressing radiation exposures)
- D. *Hazardous Waste Policy and Procedure* (CMU written document addressing hazardous waste activities)

All above items are linked from this location:

<http://www.cmu.edu/ehs/chemical/forms.html>

9. Appendices

Fact Sheets for GHS Pictograms and GHS Hazard Ratings are attached.

9.1 Fact Sheet for GHS Pictograms

New Hazard Communication Pictograms

The new OSHA Hazard Communication Standard incorporates changes to the pictograms most of us are familiar with. These new symbols are part of the Global Harmonization System, whereby the pictures are standardized throughout most of the world.

Although the Hazard Communication Standard specifically exempts laboratories, laboratory personnel will definitely see these symbols on chemical labels and Safety Data Sheets (SDS) as will our people who work with or near hazardous chemicals in non-laboratory settings.

Here is a guide to the meanings of each symbol:

 GHS Flammable	<p>This means:</p> <p>The material may burst into flame</p>	<p>This new symbol replaces this old one:</p>	
 GHS Acute Toxic	<p>This means:</p> <p>The material may cause immediate, serious health effects</p>	<p>This new symbol replaces this old one:</p>	
 GHS Corrosive	<p>This means:</p> <p>A physical or health hazard that can easily damage skin or eyes</p>	<p>This new symbol replaces this old one:</p>	
 GHS Environmental	<p>This means:</p> <p>The material can kill fish or other wildlife that live in the water</p>	<p>This new symbol replaces this old one:</p>	
 GHS Explosive	<p>This means:</p> <p>Material can blow up or otherwise create an uncontrolled reaction</p>	<p>This new symbol replaces this old one:</p>	

	<p>This means: Pressurized gas that would explode, rocket or damage health if heated, ruptured or leaking</p>	<p>This new symbol replaces this old one:</p>	
	<p>This means: The material is a physical or health hazard</p>	<p>This new symbol replaces this old one:</p>	
	<p>This means: This material may cause other materials to ignite or burn faster</p>	<p>This new symbol replaces this old one:</p>	
	<p>This means: The material is a serious health or physical hazard, or poison</p>	<p>This new symbol replace this old one:</p>	

If you work with or near hazardous chemicals, OSHA requires us to provide Hazard Communication training to you. If you have not received this training, please contact us at 8-8182.

Our Mission:
Environmental Health & Safety (EH&S) is committed to providing health and safety services that protect the University community and the environment.

<p>Carnegie Mellon University</p>	<p>Phone: 412.268.8182 • Fax: 412.268.7871 Website: www.cmu.edu/ehs</p>	<p>Environmental Health & Safety</p>
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9.2 Fact Sheet for GHS Hazard Ratings

Hazard Identification for new MSDS (SDS)

There are new OSHA regulations addressing the Hazard Identification sections of MSDS (or, Safety Data Sheets, SDS, as they are now called). The changes were made to reflect the Global Harmonization System (GHS), which is designed to unify the hazard warnings throughout the world. This sheet is designed to help you understand the changes and the two different systems currently in use.

CONFUSION ALERT! The two systems now found on MSDS are the NFPA System, which we are all familiar with, and the new GHS system, which is, unfortunately, just the opposite of the NFPA! Stick with us and we will guide you through!

 <p>THE NFPA SYSTEM:</p> <p>The NFPA system has hazard numbers ranging from 0 to 4, with 4 being the <u>most</u> hazardous and 0 being the <u>least</u> hazardous</p>	<p>THE GHS SYSTEM:</p> <p>The GHS system has hazard numbers ranging from 1 to 4, with 1 being the <u>most</u> hazardous and 4 being the <u>least</u> hazardous</p> 
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If there is something good out of all this confusion, it is that the two differing systems are *clearly and separately* indicated on most MSDS/SDS.

Details of the new GHS Terms

The new GHS System also is more detailed than the NFPA system, with ratings in many more categories. We have prepared a chart should help you understand these new categories, what they mean and the various levels which may appear in each. We know this is quite confusing and not at all what you have been used to in the past. It is, though, now a regulation that affects us all! Contact EH&S with any confusion you may have regarding the new system.

Please retain this fact sheet and refer to the chart on the back side whenever you review a MSDS/SDS

Our Mission:

Environmental Health & Safety (EH&S) is committed to providing health and safety services that protect the University community and the environment.

There are ten **HEALTH** hazard classes identified in the GHS system, any of which MAY appear in the MSDS/SDS. Not all of them have ratings ranging completely from 1 (the highest hazard) to 4 (the lowest hazard rating). Here are the things you might see...

Hazard	What this means	Ratings possible
Acute Toxicity	Quickly dangerous to humans	1 to 4
Skin corrosion/Irritation	Will damage skin	1 or 2
Serious Eye Damage/Eye Irritation	Serious damage to eyes is possible	1 or 2
Respiratory or Skin Sensitization	May affect skin or breathing, or make them susceptible to further damage	1
Germ Cell Mutagenicity	Cause undesirable changes at the cellular level	1 or 2
Carcinogenicity	Cancer-causing	1 or 2
Reproductive Toxicity	May affect the reproductive systems	1 or 2
Specific Target Organ toxicity, single exposure	Materials known to damage specific organs with one "dose"	1 to 3
Specific Target Organ toxicity, repeated exposure	Materials known to damage specific organs with multiple or long-term "doses"	1 or 2
Aspiration Hazard	Dangerous if droplets or mist is inhaled	1

There are sixteen **PHYSICAL** hazard classes identified in the GHS system, any of which MAY appear in the MSDS/SDS. Not all of them have ratings ranging completely from 1 (the highest hazard) to 4 (the lowest hazard rating). Here are the things you might see...

Hazard	What this means	Ratings possible
Explosive	Well, "explosive" says it all!	1
Flammable gases	Gases that may catch fire	1 and 2
Flammable aerosols	Aerosol cans with flammable gases present	1 and 2
Oxidizing gases	Gases which will supply oxygen to a fire (not desirable!)	1
Gases under pressure	Compressed gases	n/a
Flammable liquids	Liquids where the vapors may ignite	1 to 4
Flammable solids	Solid that ignite on contact with air or moisture	1 and 2
Self-reactive chemicals	Materials which may ignite spontaneously	A-G
Pyrophoric Liquids	Liquids that may ignite on exposure to air	1
Pyrophoric solids	Solids that may ignite on exposure to air	1
Self-heating chemicals	Materials that may give off heat	1 and 2
Water reactives	Materials that have a strong reaction to water	1 to 3
Oxidizing liquids	Liquids which will supply oxygen to a fire (not desirable!)	1 to 3
Oxidizing solids	Solids which will supply oxygen to a fire (not desirable!)	1 to 3
Organic Peroxides	Materials which may form flammable material over time	A-G
Corrosive to metals	Materials which can damage metals	1