Roger Williams University
Hazard Communication Plan

Roger Williams University
Department of Environmental Health and Safety
One Old Ferry Road
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Adopted April 26, 2011 (President's Cabinet)
Updated: Summer 2016

ROGER WILLIAMS UNIVERSITY
HAZARD COMMUNICATION PLAN

I. Introduction

The Occupational Safety and Health Administration (OSHA) requires employers with hazardous chemicals in the workplace to have a written hazard communication (HazCom) plan in accordance with the Hazard Communication standard (29 CFR 1910.1200). The HazCom Plan must include site-specific information about the following topics:

- Hazardous chemical labels and other forms of warning used onsite;
- Safety Data Sheets (SDS);
- Employee information and training requirements;
- An inventory of hazardous chemicals onsite (hazardous chemical names in the inventory must match the hazardous chemical names listed on the SDS so they may be easily referenced);
- Methods of communication of chemical hazards for non-routine tasks; and
- Means for providing this information to onsite contractors that may be exposed to chemical hazards onsite.

OSHA defines a "hazardous chemical" as "any chemical which is a physical hazard or a health hazard." Physically hazardous chemicals include: combustible liquids, compressed gases, explosives, flammables, organic peroxides, oxidizers, pyrophorics, reactives, and water-reactives (full definitions of these terms are included in the "Definitions" appendix of this plan). Health-hazardous chemicals are chemicals which can cause acute and/or chronic health effects in exposed employees. Health-hazardous chemicals include: carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which can damage the lungs, skin, eyes, or mucous membranes (full definitions of these terms are included in **Appendix (A)**). Roger Williams University (RWU) has both physically hazardous and health-hazardous chemicals on campus.

Beginning in 2012, the OSHA HazCom Standard has phased in the adoption of the GHS standards (Globally Harmonized System; OSHA calls these updates "HazCom 2012" to distinguish from "HazCom1994" requirements). This adoption means that the same standard formats and required elements are used in the US and around the world for safety data sheets, chemical labels, and pictograms. This HazCom Plan has been updated to reflect these changes.

II. Scope

The HazCom Plan applies to all RWU employees (including student employees) who handle hazardous chemicals as part of their regular job duties, including mailroom employees who handle sealed chemical containers / packages as part of their regular receiving duties. The HazCom Plan also applies to any contractors working on the RWU campus who may be exposed to hazardous chemicals while on campus.

This plan does not apply to employees such as office employees who would only encounter hazardous chemicals in non-routine, isolated instances, or who use chemically-based consumer products in their intended manner such that these chemicals are not covered by the HazCom Standard (see below; e.g., using an aerosolized disinfectant to sanitize personal work space).

This plan does not apply to employees or students handling chemicals in areas / instances which are covered by the RWU Chemical Hygiene Plan (noted below).

The majority of the hazardous chemical handling is done by the Facilities Management Department. Dining, Public Safety, Mailroom, Health Services, Athletics, and Environmental Health and Safety (EHS) employees may also handle hazardous chemicals as part of their regular job duties. RWU departments are primarily responsible for compliance with, and safe implementation of, all RWU safety programs. RWU EHS is available to assist with compliance and provide policy clarification as necessary.

RWU uses hazardous chemicals in many buildings on campus for a variety of purposes. Hazardous chemicals routinely handled on campus include:

- Paints and paint related materials, including aerosolized paints;
- Cleaners, sanitizers, and disinfectants (detergents and surfactants, hydrogen peroxide based cleaners, ammonia based cleaners, aerosolized disinfectants);
- Pool maintenance chemicals (lactic acid, muriatic acid, hypochlorite tablets);
- Gasoline and oils (automotive, vacuum pump, and vegetable / canola);
- Commercial laundry chemicals (detergents, disinfectants);
- Glycols (ethylene and polyethylene); and
- Water quality testing kits (nitrates, acids).

Chemicals used in the Marine and Natural Sciences (MNS) laboratories for lab-scale operations and experiments fall under the requirements of the RWU Chemical Hygiene Plan (CHP) and are not included in this plan. Chemicals used in the classroom workshops and art studios also fall under the CHP. Chemicals that are used in these buildings for non-laboratory / workshop purposes (e.g., cleaners used by Facilities Management custodians in such buildings for normal building cleaning routines, etc.) fall under the requirements of the HazCom Plan.

The following items are exempt from the HazCom <u>labeling requirements</u> only:

- Pesticides that are covered under the labeling requirements section of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA);
- Chemicals and chemical mixtures that are covered under the labeling requirements section of the Toxic Substances Control Act (TSCA);
- Food, food additives, color additives, drugs, cosmetics, and medical or veterinary devices or products that are covered under the labeling requirements section of Federal Food, Drug, and Cosmetic Act (FFDCA) or the Virus-Serum-Toxin Act (VSTA);
- Distilled spirits, wine, and malt beverages intended for non-industrial use as defined in the Federal Alcohol Administration Act (FAAA);
- Consumer products or hazardous substances as defined in the Consumer Product Safety Act (CPSA) and Federal Hazardous Substances Act (FHSA); and
- Agricultural or vegetable seed treated with pesticides that have been labeled in accordance with the Federal Seed Act (FSA).

The following items are <u>not covered</u> by the HazCom standard:

- Hazardous waste managed under the Resource Conservation and Recovery Act (RCRA);

- Hazardous substances being removed or remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA);
- Tobacco and tobacco products;
- Wood and wood products, excepting wood that has been treated with a hazardous chemical and could be sawed, sanded, or cut such that wood dust is generated;
- Articles (see Appendix A of this document for a full definition);
- Food, alcoholic beverages, drugs in their dispensable form, cosmetics, or consumer products / hazardous substances that are for employees' personal use or consumption, or are being used / sold as intended by the manufacturer;
- Nuisance particulates where the manufacturer can demonstrate that they do not pose a physical or health hazard;
- Ionizing and non-ionizing radiation (IR and NIR); and
- Biological hazards.

III. Hazardous Chemical Labeling

Hazardous chemical labels and other forms of warning that are posted on hazardous chemical containers are often the most readily visible and accessible means of hazard communication. Employees who handle hazardous chemicals as part of their routine job duties will see the labels and markings on the hazardous chemical containers every time they handle the containers. It is of utmost importance that hazardous chemical labels are present, correct, and legible, and that the employees are able to read and understand the information that is provided.

The following requirements apply to hazardous chemical container labels warning:

- **Each hazardous chemical container label must contain, at a minimum, the following six elements (see Appendix F for sample):**
    - **Product Identification:** Chemical Name and Product ID Number if one exists
    - **Manufacturer Contact Information:** Name, Address, Telephone Number
    - **Pictograms (See Appendix E):** Hazard diamonds that visually represent the GHS health and physical hazard categories
    - **Signal Word:** One of three words to indicate relative degree of hazard: Danger, Warning, Caution (most to least hazardous)
    - **Hazard Statement(s):** A written description of the applicable pictogram(s)
    - **Precautionary Statement(s):** Summary of important storage, handling, and use conditions such as PPE requirements, adverse storage conditions, incompatibilities / reaction products, hazardous handling environments, etc.
- **Hazardous chemical identity and other label information, including warnings, must be legible, prominently displayed, and written in English.**
    - The container may be labeled in other languages as necessary, but must retain the English labeling.
- **Other hazard warning systems that may be present on a chemical container include:**
    - NFPA (National Fire Protection Association) fire diamonds (Appendix B);
    - HMIS (Hazardous Materials Identification System) labels (Appendix C); and
    - DOT (Department of Transportation) placards and diamonds (Appendix D).
- **Portable hazardous chemical containers that are only for an employee's *immediate* use are not required to be labeled as noted above**.

    - The employee who performed the transfer of the hazardous chemical into the portable container must be the only one who uses the portable container.
- **Any hazardous chemical container that is *storing* a hazardous chemical is required to be labeled appropriately.**
    - "Storage" is any time period longer than one work shift.
    - Facilities department supervisors will provide employees with appropriate labels for non-original hazardous chemical storage containers.
    - Lab and shop managers and the MNS Stockroom will provide employees and students with appropriate labels for non-original hazardous chemical storage containers.
    - EHS will advise and assist with label selection and application requirements as necessary. Also see **Appendix (I)** for OSHA's label creation guidance document.
- **Do not remove or deface original chemical container labels and other forms of warning while the hazardous chemical container is <u>still storing</u> that chemical**
    - This includes containers that ready to be discarded as hazardous waste – do not remove or cover the original container label – place the hazardous waste label adjacent the original label.
- **Immediately remove or deface all chemical labels and other forms of warning once the hazardous chemical container is <u>empty</u> and ready to be discarded.**
    - "Deface" means completely cover with a permanently adhered substance (ink, paint) so that the original markings are not visible. Substance should be waterproof (use permanent marker, not regular marker, etc.)
    - "Empty chemical containers" are defined as having been emptied using their usual method (pouring, pumping, aspirating, etc.) and now have no more than 2.5cm / 1" or 3% of the total volume (for less than 119 gallons) remaining. This amount is considered residual and is not hazardous waste (colloquially called "RCRA Empty" – 40 CFR 261.7).
    - Empty chemical containers containing P-listed chemicals must be triple rinsed prior to being discarded to be considered "empty". See **Appendix (J)** for triple rising procedures.
    - A container with more than that amount remaining is not considered "empty" and must be managed as hazardous waste (see above).
- **Hazardous chemicals that are regulated under an OSHA substance-specific standard (e.g., formaldehyde, methylene chloride, etc.) may have additional specific labeling requirements that must be met.**
    - RWU EHS will assist departments with compliance with these standards as necessary.

IV. Safety Data Sheets (SDS)

Safety Data Sheets (SDS) are provided to hazardous chemical users by hazardous chemical manufacturers. SDS contain information about hazardous chemicals and hazardous chemical-containing products and mixtures. SDS information can include: the manufacturer name and contact information, the hazardous chemical's synonyms and identification number(s), physical and health hazards (in written form and in pictogram form), storage requirements, compatibility guidelines, personal protective equipment (PPE) requirements, transportation and disposal guidelines, and proper labeling for the NFPA, HMIS, and DOT labeling systems.

As part of the HazCom2012 updates, SDS are now required to follow a specific 16 section format. This standardization makes it easier for users to find the information they are looking for. The standard section listing and a description of the information contained in each section can be found in **Appendix (G)**.

RWU is required to have an SDS for each hazardous chemical onsite. Departments that want to bring a new hazardous chemical onto campus must present the SDS to RWU EHS for review ***prior*** to bringing the hazardous chemical on campus. EHS will review the SDS for safe storage, handling, use, PPE, and disposal requirements. EHS will add the SDS to its SDS collection if the hazardous chemical can be safely accommodated onsite, and the department may then bring the hazardous chemical onto campus.

RWU catalogs and distributes SDS to its employees in the following ways:

- RWU has a master library of RWU-specific SDS located online at the following website: **http://hq.msdsonline.com/rogerwilliamsuniversity** (known as "MSDSOnline"). Employees are provided with this website address when they take the HazCom training. A website tutorial is also provided at the training. The tutorial covers topics such as how to search for a hazardous chemical or product and how to request an SDS that is not present on the site. MSDSOnline is updated and maintained by RWU EHS on an as-needed basis.
    - All new RWU employees receive this tutorial at their new employee orientation training. They do not receive the full HazCom training unless they are in one of the departments that handle hazardous chemicals.
- RWU EHS maintains a master hard copy SDS library in the EHS office. Employees may access the library at any time the EHS office is open.

V. Employee Information and Training

RWU employees that handle hazardous chemicals as part of their routine job duties attend an initial HazCom training session when first hired and an annual refresher training presented by RWU EHS. Trainees include members of the following departments: Dining, Public Safety, Facilities Management, Health Services, Athletics, and the Mailroom. Training documentation is retained by EHS.

The RWU HazCom training includes the following information:

- Rights and responsibilities as hazardous chemical users under the HazCom standard;
- An overview of the operations in specific buildings and work area(s) that involve hazardous chemicals;
- The location of the HazCom Plan, Hazardous chemical inventory lists, and SDS (online and . copies)
- Methods and observations that can be used to detect the presence of a hazardous chemical;
- The physical and health hazards of the chemicals employees may encounter in their regular job duties;
- Explanations of the NFPA, HMIS, and DOT labeling systems;
- Review of a sample SDS and the types of information it conveys; and

- What to do in the event of a hazardous chemical spill (how to contact emergency services, etc.).

VI. Hazard Communication for Non-Routine Tasks (RWU Employees) and Contractors

RWU employees that will be performing non-routine tasks involving hazardous chemicals must undergo a task-and-chemical-specific version of the HazCom training prior to beginning the task. All of the topics covered in the general HazCom training must be covered as they pertain to the non-routine task. The training will be provided by the department supervisor / manager and must be documented.

Contractors working onsite at RWU that may be exposed to hazardous chemicals will be provided the following via the "Contractor" account on Traincaster:

- Access to RWU's SDS collection via a link to MSDSOnline;
- Access to RWU's HazCom Plan, which includes information about the hazardous chemical labeling systems used on campus; and
- Access to RWU's Public Safety Dispatch number to call in the event of a hazardous chemical emergency (x3333 for on-campus phones and 401-254-3333 for off-campus and cell phones).

The department hosting the contractor is responsible for providing them with this information as well as other site safety information included in the "Contractor" training login and curriculum.

VII. Location of HazCom Plan, Chemical Inventory Lists, and SDS Collection

A hard copy of the HazCom Plan will be stored in the EHS office in the Facilities building. A downloadable / readable .pdf copy will also be available online on the RWU EHS website. Employees may request a hard copy of the HazCom Plan from the EHS office, or from their supervisor, if the employee does not have ready access to a computer or the EHS website during their routine work activities. The master chemical inventory list and SDS collection is housed in the RWU EHS office and online at RWU's MSDSOnline site (http://hq.msdsonline.com/rogerwilliamsuniversity).

Some departments may maintain their own building and work-area specific SDS and chemical inventory lists. These locations are designated by the departments – for access, see a department supervisor or manager.

Appendix A: Definitions of Terms

The following definitions are provided by OSHA in 29 CFR 1910.1200(c) “Definitions”:

"Article" means a manufactured item other than a fluid or particle:

(i) which is formed to a specific shape or design during manufacture;

(ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and

(iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

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

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

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

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

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

"Compressed gas" means:

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

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

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

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

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

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

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

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

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

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

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

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

(v) "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.

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

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

"Health hazard" means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes

chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

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

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

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

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

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

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

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

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

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

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

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

Appendix B: NFPA Fire Diamond and Explanation of Symbols and Number Ratings

The NFPA (National Fire Protection Association) fire diamond is described in NFPA 704. The red (flammability), blue (health), and yellow (instability) sections contain hazard ratings numbers between 0 – 4 (least to most hazardous), and the white section may contain information on the chemical's special hazards (the section is left blank if no special hazards exist).

Further descriptions of the hazard ratings and special hazards are below (taken from NFPA 704):

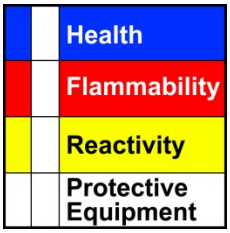
Health Hazards
"Materials that, under emergency conditions…"
4 - Can be lethal
3 - Can cause serious or permanent injury
2 - Can cause temporary incapacitation or residual injury
1 - Can cause significant irritation
0 - Would offer no hazard beyond that of ordinary combustible materials

Flammability Hazards
4 – Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily
3 - Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.
2 - Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air.
1 - Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur.
0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

Instability (Reactivity) Hazards
4 - Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.
3 - Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction but that require a strong initiating source or must be heated under confinement before initiation
2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures
1 - Materials that in themselves are normally stable but that can become unstable at elevated temperatures and pressures
0 - Materials that in themselves are normally unstable, even under fire conditions

Special Hazards
~~W~~ - Water-reactive
OX - Oxidizer
SA - Simple asphyxiant gases (nitrogen, helium, neon, argon, krypton, and xenon)

Appendix C: HMIS Label and Explanation of Symbols and Number Ratings



The Hazardous Materials Identification System (HMIS) labeling system was originally developed by the National Paint and Coatings Association. The system is similar, but not identical, to the NFPA diamond. The red (flammability), blue (health), and yellow (instability) sections contain hazard ratings numbers between 0 – 4 (least to most hazardous), and the white section notes which types of personal protective equipment should be used when handling that chemical.

Further descriptions of the hazard ratings and special hazards are below:

Health Hazards

4 - Life-threatening, major or permanent damage may result from single or repeated overexposures
3 - Major injury likely unless prompt action is taken and medical treatment is given
2 - Temporary or minor injury may occur
1 - Irritation or minor reversible injury possible
0 - No significant risk to health

Flammability Hazards
(Same as NFPA – See Appendix B)

Instability (Reactivity) Hazards
(Same as NFPA – See Appendix B)

Protective Equipment

A: Safety Glasses
B: Safety Glasses, Gloves
C: Safety Glasses, Gloves, Protective Apron
D: Face Shield, Gloves, Protective Apron
E: Safety Glasses, Gloves, Dust Respirator
F: Safety Glasses, Gloves, Protective Apron, Dust Respirator
G: Safety Glasses, Gloves, Vapor Respirator
H: Splash Goggles, Gloves, Protective Apron, Vapor Resp.
I: Safety Glasses, Gloves, Dust Resp. Vapor Resp.
J: Splash Goggles, Gloves, Protective Apron, Dust Resp., Vapor Resp.
K: Air Line Mask or hood, Gloves, Full Suit, Boots
L - Z: Site-Specific Labels

Appendix D: Department of Transportation (DOT) Placards and Diamonds

The Department of Transportation (DOT) uses hazard placards and diamonds to mark its transportation vehicles and packages and containers being transported. These hazards provide a pictorial and written description of the chemical hazards associated with that container, package, or load. More than one placard or diamond may be used at once to indicate multiple hazards. The primary hazard (determined by the DOT's "Precedence of Hazard" table) will always be the uppermost diamond or placard displayed. Secondary hazards will be located beneath or adjacent the primary hazard.

The DOT placards / diamonds are pictured below:

Class 1.1 through 1.4 – Explosives	
Class 2.1 – Flammable Gas **Class 2.2 – Non-Flammable Gas** **Class 2.3 – Toxic Gas**	
Class 3 – Flammable Liquid	
Class 4.1 – Flammable Solid **Class 4.2 – Spontaneously Combustible** **Class 4.3 – Dangerous When Wet**	
Class 5.1 – Oxidizer **Class 5.2 – Organic Peroxides**	
Class 6.1 – Toxic **Class 6.1 PIH – Poison Inhalation Hazard**	
Class 6.2 – Biological Hazard	**Not covered by the HazCom Plan**
Class 7 – Radioactive	
Class 8 – Corrosive	
Class 9 – Miscellaneous Dangerous	

Appendix E: HazCom 2012 Pictograms

From: https://www.osha.gov/Publications/OSHA3491QuickCardPictogram.pdf

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Flame**  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	**Exclamation Mark**  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	**Corrosion**  • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	**Exploding Bomb**  • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  • Oxidizers	**Environment** **(Non-Mandatory)**  • Aquatic Toxicity	**Skull and Crossbones**  • Acute Toxicity (fatal or toxic)

Appendix F: Sample Label Showing 6 Required Elements

From: https://www.osha.gov/Publications/OSHA3636.pdf

OXI252
(disodiumflammy)
CAS #: 111-11-11xx

Danger

May cause fire or explosion; strong oxidizer
Causes severe skin burns and eye damage

Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wear protective neoprene gloves, safety goggles and face shield with chin guard. Wear fire/flame resistant clothing. Do not breathe dust or mists. Wash arms, hands and face thoroughly after handling. Store locked up. Dispose of contents and container in accordance with local, state and federal regulations.

First aid:
IF ON SKIN (or hair) or clothing[6]: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash contaminated clothing before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Immediately call poison center.
Specific Treatment: Treat with doctor-prescribed burn cream.

Fire:
In case of fire: Use water spray. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Great Chemical Company, 55 Main Street, Anywhere, CT 064XX Telephone (888) 777-8888

Appendix G: Standard SDS Format (16 Sections)

From: https://www.osha.gov/Publications/OSHA3493QuickCardSafetyDataSheet.pdf

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*
Section 13, Disposal considerations*
Section 14, Transport information*
Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

Appendix H: Comparison of NFPA704 and HCS2012 Labels
From: https://www.osha.gov/Publications/OSHA3678.pdf

Comparison of NFPA 704 and HazCom 2012 Labels

	 NFPA 704	 HazCom 2012
Purpose	Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response.	Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies.
Number System: NFPA Rating and OSHA's Classification System	0-4 0-least hazardous 4-most hazardous	1-4 1-most severe hazard 4-least severe hazard • The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2. • Numbers are used to CLASSIFY hazards to determine what label information is required.
Information Provided on Label	• Health-Blue • Flammability-Red • Instability-Yellow • Special Hazards*-White *OX Oxidizers W Water Reactives SA Simple Asphyxiants	• Product Identifier • Signal Word • Hazard Statement(s) • Pictogram(s) • Precautionary statement(s); and • Name address and phone number of responsible party.
Health Hazards on Label	Acute (short term) health hazards ONLY. Acute hazards are more typical for emergency response applications. Chronic health effects are not covered by NFPA 704.	Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens.
Flammability/ Physical Hazards on Label	NFPA divides flammability and instability hazards into two separate numbers on the label. Flammability in red section Instability in yellow section	A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics,combustible dusts and corrosives.
Where to get information to place on label	Rating system found in NFPA Fire Protection Guide to Hazardous Materials **OR** NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition. Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704	OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). 1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards) 2) Label using Appendix C
Other	The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond.	Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use.
website	www.nfpa.org/704	www.osha.gov **OR** www.osha.gov/dsg/hazcom/index.html

Appendix I: Creating NFA704 and HCS2012 Labels from SDS Information
From: https://www.osha.gov/Publications/OSHA3678.pdf

To create an OSHA label per HazCom 2012:

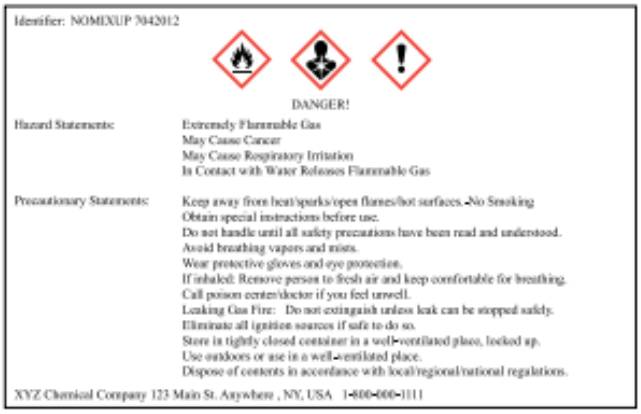
Step 1: Perform the classification in accordance with Appendix A: Health Hazards & Appendix B Physical Hazards of 29 CFR 1910.1200 — this is where you find the criteria for each hazard class and hazard category.

Class: Flammable Gas, Category 1

Class: Carcinogen, Category 1B

Class: Specific Target Organ Toxicity (Single Exposure), Category 3

Class: Substances and Mixtures Which, in Contact with Water, Emit Flammable Gases, Category 3


Identifier: NOMIXUP 7042012

DANGER!

Hazard Statements: Extremely Flammable Gas
May Cause Cancer
May Cause Respiratory Irritation
In Contact with Water Releases Flammable Gas

Precautionary Statements: Keep away from heat/sparks/open flames/hot surfaces.-No Smoking
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing vapors and mists.
Wear protective gloves and eye protection.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Call poison center/doctor if you feel unwell.
Leaking Gas Fire: Do not extinguish unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
Store in tightly closed container in a well-ventilated place, locked up.
Use outdoors or use in a well-ventilated place.
Dispose of contents in accordance with local/regional/national regulations.

XYZ Chemical Company 123 Main St. Anywhere , NY, USA 1-800-000-1111

Step 2: Gather labeling information (Pictograms, Signal Word, Hazard Statements) from Appendix C of 29 CFR 1910.1200 based on the chemical's hazard class and category.

Step 3: Create the Label

To Create NFPA 704 label:

Step 1: Collect information on hazards from applicable sections of SDS. Some SDSs may provide the NFPA diamond symbol with hazard rating numbers filled in already. **Note: Do NOT use the hazard category numbers given in section 2 of HazCom 2012 compliant SDS on 704 label!**

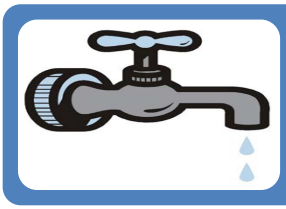
If the diamond is not provided on the SDS you can obtain the information under the following sections of the SDS. Note that additional information may be provided in other sections of the SDS.

- Health hazard information under Section 11
- Flammability information under Section 9
- Instability information under Section 10
- Special information under Section 9, 10, 11

Step 2: Obtain current edition copy of NFPA 704 or view on line at www.nfpa.org/704. Compare the criteria on the SDS sections as shown above with the criteria shown in Tables 5.2 (Health), 6.2 (Flammability), 7.2 (Instability) and 8.2 (Special Hazards).

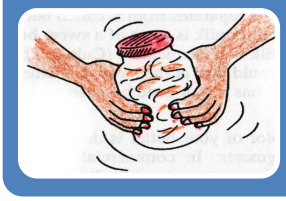
Step 3: Place numbers for the degree of hazard associated with the criteria obtained in Step 2 in the correct quadrant of NFPA 704 placard.

Appendix J: Triple Rinse Procedures for P-Listed Chemical Containers



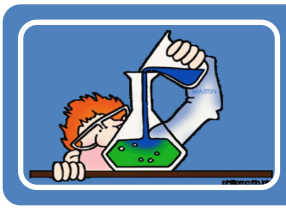
Add Solvent to Container

- At least 10% of container volume



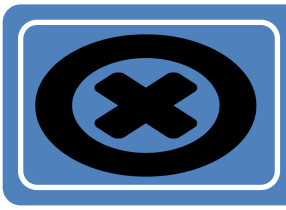
Close and Shake Container

- Close cap completely
- Shake vigorously for ~ 30 seconds



Empty Used Solvent (Rinsate) into Waste Container

Repeat above steps three times



Deface or remove labels completely

Recycle / dispose of container

Manage Rinsate as Haz. Waste