Hazard Communication Program

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DOCUMENT REVISION LOG

Document: **Hazard Communication Program**

Rev. No.	Effective Date	Revision Description	Pages Replaced	Completed by:
1		New format, updated definitions and attachments		Scheryl

ACRONYMS

CFR	Code of Federal Regulations
DOT	Department of Transportation
EHS	Environmental Health and Safety
EHSA	EHS Assistant
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
HazCom	Hazard Communication
OSHA	Occupational Safety & Health Administration
PEL	Permissible Exposure Limit
PI	Principal Investigator
PPE	Personal Protective Equipment
RMM	Research Material Management
SDS	Safety Data Sheets

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1. PURPOSE

The Occupational Safety and Health Administration (OSHA) passed the Hazard Communication Standard (the "HazCom Standard" or the "Standard") to ensure that the hazards of all chemicals produced or imported are classified, and that information concerning hazards is transmitted to the users. The Standard was originally passed in 1986, revised in 1994, and revised again in 2012. The text of the standard may be found at 29 CFR 1910.1200.

OSHA's HazCom Standard is based on the concept that employees have a right to know the hazards and identities of the chemicals with which they work. The following are key elements:

1. Chemical manufacturers and importers must:
    a) Classify the hazards of chemicals that they produce or import;
    b) Prepare safety data sheets (SDS), formerly known as Material Safety Data Sheets or MSDS; and
    c) Provide labels that meet certain criteria.
2. Employers must provide hazard information to their employees by means of:
    a) A hazard communication program;
    b) Labels and other forms of warning;
    c) Safety data sheets; and
    d) Information and training.

This document and its attachments comprise the University of New Mexico's written Hazard Communication Program required by the Standard.

2. SCOPE

This program is applicable to all UNM employees and contractors, with these exceptions:

1. This section applies to laboratories only as follows:
    a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.
    b) Employers shall maintain any safety data sheets that are received with incoming shipments and ensure they are readily accessible to employees in their work areas.
    c) Employers shall ensure that laboratory employees are provided information and training as described in section 9 of this program.
    d) Additional requirements for laboratory operations are found in the procedure titled "Chemical Hygiene Plans".

2. Operations by the University of New Mexico, not located within Albuquerque, New Mexico (i.e. branch campuses, research stations, ranches, etc.) shall use the information contained herein as a guide to creating their own compliance programs.

3. RESPONSIBILITIES

3.1. Environmental Health & Safety (EHS)

Responsibilities include, but are not limited to:

1. Developing the written Hazard Communication Program;
2. Providing training and training materials in compliance with the Program; and
3. Assisting departments with their HazCom training needs upon request.

3.2. Supervisors

Responsibilities for departments, not including laboratories, are as follows:

1. Ensuring that employees with potential for exposure to hazardous chemicals receive appropriate training and Personal Protective Equipment (PPE) before working with those chemicals;
2. Identifying, listing and maintaining a current inventory of all chemicals in use or stored in their areas;
3. Obtaining SDS's for each hazardous chemical from the manufacturer;
4. Ensuring that all safety data sheets are readily available to employees;
5. Ensuring that chemical containers are labeled properly;
6. Providing training in the hazards of non-routine tasks (periodic maintenance, cleaning up spills, special shop clean-ups, emptying holding tanks, confined space entry, cleaning of reactor vessels, etc.);
7. Ensuring that any on-site contractor is provided with the description of hazardous chemicals to which the contractor's employees may be exposed;
8. Ensuring piping within the work area is labeled (See Attachment B); and
9. Providing area-specific OSHA Hazard Communication Standard training.

3.3. Principal Investigators (PIs)

Responsibilities for laboratories under this procedure include:

1. Ensuring that employees receive appropriate training for the hazards of the work;
2. Ensuring that labels are not removed or defaced;
3. Ensuring that any SDSs received are maintained in a readily accessible manner;

4. Complying with all PI responsibilities for other applicable EHS procedures including those outlined in the Chemical Hygiene Plan, such as:

   a) Conducting written hazard assessments for the work to be conducted; and

   b) Providing adequate resources, PPE, and training for mitigation of these hazards.

3.4. Employees

Responsibilities include, but are not limited to:

1. Successfully completing training as required in this procedure, including passing any competence tests; and
2. Complying with all established safety and health procedures established in the workplace.

4. DEFINITIONS

4.1. [29 CFR 1910.1200(c)]

Article - a manufactured item other than a fluid or particle which:

1. Is formed to a specific shape or design during manufacture;
2. Has end use function(s) dependent in whole or in part upon its shape or design during end use; and
3. Under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

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

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

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

Chemical name - 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.

Classification – to identify the relevant data regarding the hazards of a chemical; review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical. In addition, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.

Commercial account - an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

Common name - 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.

Container – any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. Pipes or piping systems, engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.

Container - any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

Designated representative - any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

Director - the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

Distributor - a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

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

Exposure or exposed - 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).

Foreseeable emergency - any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

Hazard category – the division of criteria within each hazard class, e.g., oral acute toxicity and flammable liquids include four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.

Hazard class – the nature of the physical or health hazards, e.g., flammable solid, carcinogen, oral acute toxicity.

Hazard not otherwise classified (HNOC) – an adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes otherwise addressed. This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed, but the effect either falls below the cut-off value/concentration limit of the hazard class or is under a GHS hazard category that has not been adopted by OSHA.

Hazard statement – a statement assigned to a hazard class and category that describes the nature of the hazards) of a chemical, including, where appropriate, the degree of hazard.

Hazardous chemical - any chemical which is a physical hazard or a health hazard.

Health hazard - 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 of 29 CFR 1910.1200 provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B of 29 CFR 1910.1200 describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of the Standard. These are listed in Attachments C and D.

Immediate use - 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.

Importer - the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

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

Label elements – the specified pictogram, hazard statement, signal word and precautionary statement for each hazard class and category.

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

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

Pictogram – a composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, that it intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under the Standard for application to a hazard category.

Produce - to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

Product identifier – the name or number used for a hazardous chemical on a label or in the SDS. It provides a unique means by which the user can identify the chemical. The product identifier used shall permit cross-references to be made among the list of hazardous chemicals required in the written hazard communication program, the label and the SDS.

Pyrophoric gas - a chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

Responsible party - someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

Safety data sheet (SDS) - written or printed material concerning a hazardous chemical.

Signal word – a word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used in this section are "danger" and "warning". "Danger" is used for the more severe hazards, while "warning" is used for the less severe.

Simple asphyxiant – a substance or mixture that displaces oxygen in the ambient atmosphere, and can thus cause oxygen deprivation in those who are exposed, leading to unconsciousness and death.

Specific chemical identity - the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

Substance – chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

Trade secret - any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D of 29 CFR 1910.1200, available at www.osha.gov, sets out the criteria to be used in evaluating trade secrets.

Use - to package, handle, react, emit, extract, generate as a byproduct, or transfer.

Work area - a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

Workplace - an establishment, job site, or project, at one geographical location containing one or more work areas.

4.2. Other Definitions

Water reactive chemicals - solid or liquid chemicals which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

Compressed gas: - a gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature ≤ 50°C (-58°F).

Corrosive to metals - A chemical which by chemical action will materially damage, or even destroy, metals.

Dissolved gas - a gas which when under pressure is dissolved in a liquid phase solvent.

Explosive chemical – a solid or liquid chemical which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic chemicals are included even when they do not evolve gases.

Fire point - the lowest temperature at which a volatile combustible substance continues to burn in air after its vapors have been ignited (as when heating is continued after the flash point has been determined).

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

1. Aerosol - Any non-refillable receptacle containing a gas compressed, liquefied or dissolved under pressure, and fitted with a release device allowing the contents to be ejected as particles in suspension in a gas, or as a foam, paste, powder, liquid or gas.
2. "Gas, flammable" - A gas having a flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi).
3. "Liquid, flammable" - a liquid having a flash point of not more than 93°C (199.4°F).
4. "Solid, flammable" - a solid which is a readily combustible solid, or which may cause or contribute to fire through friction.

Flashpoint - the minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

Gases under pressure - gases which are contained in a receptacle at a pressure of 200 kPa (29 psi) (gauge) or more, or which are liquefied or liquefied and refrigerated. They comprise compressed gases, liquefied gases, dissolved gases and refrigerated liquefied gases.

Liquefied gas - a gas which when under pressure is partially liquid at temperatures above -50°C (-58°F).

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

Oxidizing Gases - any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.

Oxidizing Liquids - Liquids which, while of themselves not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.

Oxidizing Solids - Solids which, while themselves are not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other materials.

Pyrophoric Liquids - Liquids which, even in small quantities, are liable to ignite within five minutes after coming into contact with air.

Reactivity – A substance's susceptibility to undergo a chemical reaction or change that may result in dangerous side effects, such as an explosion, burning, and corrosive or toxic emissions.

Refrigerated liquefied gas - A gas which is made partially liquid because of its low temperature.

Self-Heating chemicals - Solid or liquid chemicals, other than a pyrophoric liquid or solid, which, by reaction with air and without energy supply, are liable to self-heat; these chemicals differ from a pyrophoric liquid or solid in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).

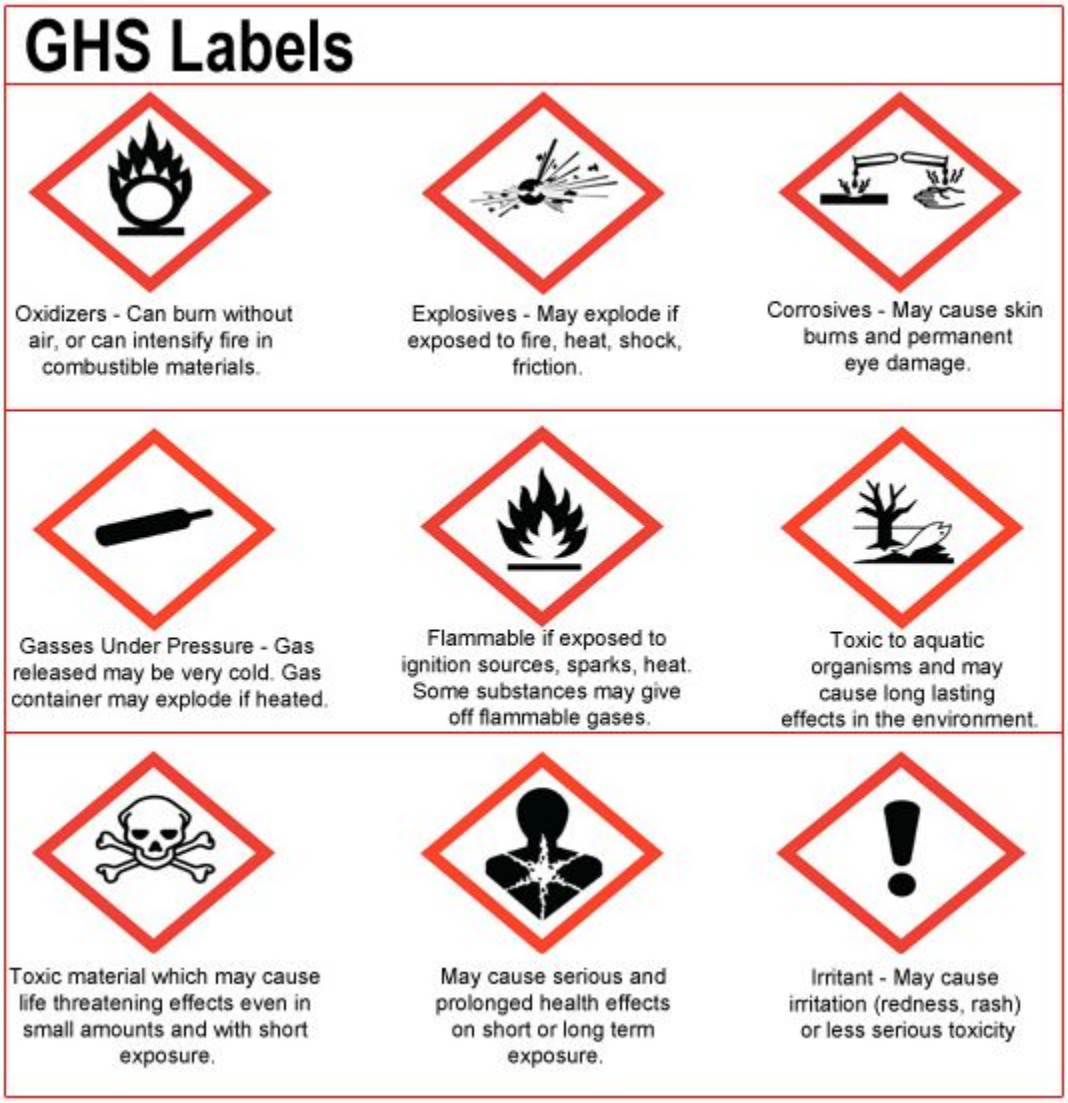
Self-Reactive chemicals - thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes chemicals classified under Appendix B as explosives, organic peroxides, oxidizing liquids or oxidizing solids.

Unstable – Tending toward decomposition or other unwanted chemical change during normal handling or storage.

5. HAZARD IDENTIFICATION

5.1. Pictograms

A hazard symbol on a white background with a red, diamond-shaped frame.



5.2. Signal Word

Indicates the relative level of severity of a potential hazard.

1. **Danger** – more severe hazard
2. **Warning** – less severe hazard

If “Danger” is used, “Warning” is not to be used.

5.3. Precautionary statement

The precautionary statement is composed of phrases and/or pictograms that describe recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or from the improper storage or handling of a hazardous product.

There are 116 individual and 33 combined Precautionary statements – these are assigned a unique alphanumerical code which consists of one letter and three numbers as follows:

1. The letter "P" (for "precautionary statement");
2. One number designating the type of precautionary statement as follows:

a) "1" for general precautionary statements (“P1xx”);

b) "2" for prevention precautionary statements (“P2xx”);

c) "3" for response (in case of spillage or exposure) precautionary statements (“P3xx”);

d) "4" for storage precautionary statements (“P4xx”); and

e) "5" for disposal precautionary statements (“P5xx”).

3. Two numbers corresponding to the sequential numbering of precautionary statements (“xx” in the above examples).

Precautionary pictograms may be used to communicate precautionary statement information, but are not required to be used.

5.4. Product identifier

1. Chemical identity of the substance
2. For mixtures and alloys, chemical identities of:

a) all the ingredients/alloying elements contributing to the hazard of the mixture/alloy (as specified by the competent authority); or,

b) all the ingredients/alloying elements contributing to:

i. Acute toxicity

ii. Skin corrosion/serious eye damage

iii. Germ cell mutagenicity

iv. Carcinogenicity

v. Reproductive toxicity

vi. Skin/respiratory sensitization

vii. Specific target organ toxicity

5.5. Hazard Classification at UNM

The University will rely on the hazard classifications (formerly known as hazard determinations or hazard assessments) performed by the manufacturer or importer of the chemical as provided on the SDSs and labels, as the official hazard classification for commercially acquired chemicals.

UNM employees who develop new chemical mixtures must, at a minimum, use process knowledge and professional judgment to determine the likely hazards of the new mixture and label it accordingly. If new chemicals are to be sent offsite, a SDS must be developed and additional labeling requirements apply under DOT regulations. Contact EHS for assistance before shipping.

Industrial Hygiene walk-through surveys will identify and evaluate chemical hazards for specific work areas and/or processes and operations. Frequency of monitoring shall be as specified in the relevant OSHA regulations, or where no OSHA regulation applies, as specified by EHS's industrial hygiene staff.

6. LABELING

Except as provided below, each container of hazardous materials in the workplace should be labeled, tagged or marked with either:

1. The information required for shipping containers, or
2. The product identifier and words, pictures, symbols or combinations thereof which provide at least general information regarding the hazards of the chemical, and which, in conjunction with the other information available under the HazCom Program, will provide employees with the specific information regarding the physical and health hazards of the chemical.

   The information required on a GHS label includes (See Attachment E for more information):
   a. Hazard pictograms
   b. Signal words
   c. Hazard statements
   d. Precautionary statements and pictograms
   e. Product identifier
   f. Supplier information

The exceptions are these:

1. UNM may use signs, placards, process sheets, batch tickets, operating procedures or other materials in lieu of affixing labels on individual stationary process containers as long as the alternative method identifies the containers to which it is applicable and conveys the information required to be on a label.

2. Portable containers which are filled from labeled containers and which are intended only for the immediate use of the employee who performs the transfer need not be labeled. If the container is left unattended, a label is required.

In a laboratory setting, labeling requirements are as follows:

1. The manufacturer's label is usually sufficient. The label must not be removed or defaced unless the container is immediately relabeled with all the required information.
2. Labels must be in English. Additional languages may be added, as long as the information is available in English as well.
3. Food containers, unlabeled, or inappropriately labeled containers are forbidden for chemical storage.
4. Labels must have the identity and hazards of the contents.

The labels must be maintained in a readable condition. Any container without a label should be reported to the supervisor immediately. All pipes must be labeled in accordance with UNM's policy (refer to Attachment B).

Containers into which chemical waste are being accumulated must be labeled "Hazardous Waste" and specify the chemical content (see EHS Procedure: "Hazardous Chemical Waste Program").

7. CHEMICAL INVENTORY

The OSHA HazCom standard requires that a list of all hazardous chemicals in the workplace be compiled and maintained, and this inventory shall be readily accessible to employees.

The University of New Mexico provides a centralized, web-based inventory system known as Research Material Management, or RMM, to facilitate this requirement. All laboratories are required to maintain an up-to-date, accurate inventory of all chemicals used in each work area in RMM. This list must be updated whenever a new chemical is ordered or when chemical use is discontinued.

Training in the use of RMM is available online in Learning Central or in-person by request. Contact EHS at 505-277-2753 for more information.

Work areas with hazardous chemicals that are not laboratories or makers spaces must also keep an inventory of chemicals. However, the use of RMM is not required for these areas, such as maintenance storage areas. These inventories can be paper or digital but should be kept current.

8. SAFETY DATA SHEETS

Under the Standard, the role of the SDS (previously known as the Material Safety Data Sheet) is to provide detailed information to employees about each hazardous chemical, including its potential adverse physical and health hazards, its physical and chemical characteristics, recommendations for appropriate protective clothing/equipment, OSHA PELs, fire hazards, spill cleanup measures, as well as many other valuable types of information. Information to be included in the SDS can be found in Attachment A. Comprehensive information regarding the GHS may be found at: http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html

Chemical manufacturers, importers, and distributors of hazardous chemicals are all required to develop/obtain and provide the appropriate safety data sheets to the purchasers to whom they ship chemicals. It is the responsibility of each principal investigator or other person responsible for any specific workplace to obtain and maintain a SDS for every chemical/material onsite or newly purchased chemical. Once a complete list/inventory has been compiled of the potentially hazardous chemicals in your area, check your files against the inventory you have just compiled.

SDSs must be readily accessible to employees and students when they are in the area where the chemicals are used or stored. As long as employees/students can get the information when they need it, any approach may be used (hard copies or digital files on a computer that all employees can access).

As new chemicals are purchased, the inventory and SDSs should be updated on a continuing basis. OSHA requires manufacturers to send SDSs within 30 days of a written or telephoned request. The following are the options for maintaining chemical inventory and SDSs at UNM:

1. RMM
2. Chemwatch
3. A binder with printed copies
4. EHSA

SDS Retention Policy: According to 29 CFR 1910.1020(d)(1)(ii)(B), SDSs "need not be retained for any specified period as long as some record of the identity (chemical name if known) of the substance or agent, where it was used, and when it was used is retained for at least 30 years." Therefore, the information regarding the use of chemicals should be retained in the laboratory records for at least 30 years. Any chemical exposures known or suspected to be at or above the applicable exposure limit or action level, or resulting in employee symptoms, must be reported to Employee Occupational Health Services so that the information can be included in the employee medical record.

What items may be exempted from the SDS requirement?
Exempted are the **personal** use of articles, food, food additives, alcoholic beverages, cosmetics, drugs and pharmaceuticals, hazardous wastes, tobacco and tobacco products, wood and lumber, office and school supplies, ionizing and non-ionizing radiation, and consumer products. Retail outlets and stores are under no obligation to distribute SDSs for these exempted products to consumers, and if they are used in the workplace in a like manner as the consumer, the SDS is not required. However, use of these “exempted” materials in a quantity or manner that causes an occupational exposure – in other words, not in the same manner as a consumer would use it - triggers the requirement for the procurement and distribution of the SDS.

9. EMPLOYEE INFORMATION AND TRAINING

Every UNM employee must receive basic orientation to the Hazard Communication Program, provided by a Chemical Hygiene Officer (or designee) or supervisor using training materials provided by EHS, or taken online. It is the responsibility of the supervisor to ensure that the training is successfully completed and documented. The employee should also maintain his or her own records. The training must include the following information at a minimum:

1. Requirements of the OSHA Hazard Communication Standard;
2. Explanation of UNM's Hazard Communication Program, including labeling system, SDSs and how employees can obtain hazard information;

3. Description of the various methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area;
4. General guidance on the selection of protective measures to reduce chemical exposure;
5. Information on safety resources; and
6. General emergency procedures to be used in the event of accidental exposure to hazardous chemicals, including emergency phone numbers.

In addition to the general Hazard Communication training, employees must be provided with area-specific on-the-job training. This training is to be conducted by the supervisor and will inform employees of the following:

1. The location of UNM's written Hazard Communication Program, the chemical inventory list and SDSs for their work area;
2. The specific physical and health hazards present in their work area;
3. The operations in their work area where hazardous chemicals are used;
4. The specific protective measures required when using the chemicals in their work area, including the procedures that have been implemented to protect them from exposure to hazardous chemicals;
5. The specific methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area; and
6. The location of eye washes and safety showers, to be used in the event of a chemical exposure.

The general hazard communication orientation must be conducted at the time of the employee's initial assignment and periodically refreshed thereafter. Area-specific training must be conducted whenever a new hazard is introduced into the work area, when the employee transfers to another job, and/or whenever the employee demonstrates behavior that indicates a lack of understanding of the safe handling of chemicals.

Supervisors are responsible for ensuring that employees with potential exposure to hazardous chemicals receive the appropriate training before working with those chemicals. To ensure that supervisors are knowledgeable of their training responsibilities, EHS will conduct train-the-trainer courses and provide training templates for all supervisors.

9.1. Non-Routine Tasks.

Supervisors must provide employees with the hazard information for non-routine tasks before the tasks are attempted. This includes reviewing the SDSs, preparing a safety plan for the non-routine work, and explaining, demonstrating, or otherwise communicating the appropriate work practices to be followed.

All training must be documented by the individual presenting the training session, and kept on file in the event of an OSHA inspection.

10. INFORMING CONTRACTORS

If chemicals are to be used by UNM personnel in the same area in which a contractor's employees are assigned, the Principal Investigator and the UNM Project Manager have the responsibility of informing the contractor's employees of the potential hazards in the work area. The information to be transmitted includes but is not limited to the following:

1. The hazards of the chemicals to which they may be exposed while working in the area;

2. Precautionary measures the contractor employees should take to lessen the risk of exposure and the steps UNM has taken to lessen the risks;
3. The location of SDSs for the products used by UNM personnel;
4. UNM's written Hazard Communication program; and
5. UNM's chemical labeling system.

Conversely, if a contractor is to use hazardous chemicals on UNM property, the contractor is to provide the UNM project manager with a list of the hazardous chemicals and SDSs for the chemicals to be used at UNM. For more information on contractor requirements, see the Construction Safety Manual.

11. ATTACHMENTS

11.1. A – Minimum Information for a Safety Data Sheet (SDS)

11.2. B – Painting and Identification of Piping and Equipment

11.3. C - OSHA Hazard Communication, 29 CFR 1910.1200, Appendix A and OSHA's *Guidance for Hazard Determination*

11.4. D – OSHA Hazard Communication, 29 CFR 1910.1200, Appendix B, Physical Criteria

11.5. E - OSHA Hazard Communication, 29 CFR 1910.1200, Appendix C, Allocation of Label Elements

ATTACHMENT A

MINIMUM INFORMATION FOR A SAFETY DATA SHEET

29 CFR 1910.1200, APPENDIX D

APPENDIX D TO §1910.1200 – SAFETY DATA SHEETS (MANDATORY)

A safety data sheet (SDS) shall include the information specified in Table D.1 under the section number and heading indicated for sections 1-11 and 16. If no relevant information is found for any given subheading within a section, the SDS shall clearly indicate that no applicable information is available. Sections 12-15 may be included in the SDS, but are not mandatory.

Table D.1. Minimum Information for an SDS

	Heading	**Subheading**
1.	**Identification**	(a) Product identifier used on the label; (b) Other means of identification; (c) Recommended use of the chemical and restrictions on use; (d) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party; (e) Emergency phone number.
2.	**Hazard(s) identification**	(a) Classification of the chemical in accordance with paragraph (d) of §1910.1200; (b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200. (Hazard symbols may be provided as graphical reproductions in black and white or the name of the symbol, e.g., flame, skull and crossbones); (c) Describe any hazards not otherwise classified that have been identified during the classification process; (d) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration ≥ 1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required.

	Heading	Subheading
3.	**Composition/ information on ingredients**	Except as provided for in paragraph (i) of §1910.1200 on trade secrets: **For Substances** (a) Chemical name; (b) Common name and synonyms; (c) CAS number and other unique identifiers; (d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance. **For Mixtures** In addition to the information required for substances: (a) The chemical name and concentration (exact percentage) or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of §1910.1200 and (1) Are present above their cut-off/concentration limits; or (2) Present a health risk below the cut-off/concentration limits. (b) The concentration (exact percentage) shall be specified unless a trade secret claim is made in accordance with paragraph (i) of §1910.1200, when there is batch-to-batch variability in the production of a mixture, or for a group of substantially similar mixtures (*See* A.0.5.1.2) with similar chemical composition. In these cases, concentration ranges may be used. **For All Chemicals Where a Trade Secret is Claimed** Where a trade secret is claimed in accordance with paragraph (i) of §1910.1200, a statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.
4.	**First-aid measures**	(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion; (b) Most important symptoms/effects, acute and delayed. (c) Indication of immediate medical attention and special treatment needed, if necessary.
5.	**Fire-fighting measures**	(a) Suitable (and unsuitable) extinguishing media. (b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products). (c) Special protective equipment and precautions for fire-fighters.
6.	**Accidental release measures**	(a) Personal precautions, protective equipment, and emergency procedures. (b) Methods and materials for containment and cleaning up.
7.	**Handling and storage**	(a) Precautions for safe handling. (b) Conditions for safe storage, including any incompatibilities.
8.	**Exposure controls/personal protection**	(a) OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available. (b) Appropriate engineering controls. (c) Individual protection measures, such as personal protective equipment.

	Heading	Subheading
9.	**Physical and chemical properties**	(a) Appearance (physical state, color, etc.); (b) Odor; (c) Odor threshold; (d) pH; (e) Melting point/freezing point; (f) Initial boiling point and boiling range; (g) Flash point; (h) Evaporation rate; (i) Flammability (solid, gas); (j) Upper/lower flammability or explosive limits; (k) Vapor pressure; (l) Vapor density; (m) Relative density; (n) Solubility(ies); (o) Partition coefficient: n-octanol/water; (p) Auto-ignition temperature; (q) Decomposition temperature; (r) Viscosity.
10.	**Stability and reactivity**	(a) Reactivity; (b) Chemical stability; (c) Possibility of hazardous reactions; (d) Conditions to avoid (e.g., static discharge, shock, or vibration); (e) Incompatible materials; (f) Hazardous decomposition products.
11.	**Toxicological information**	Description of the various toxicological (health) effects and the available data used to identify those effects, including: (a) Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact); (b) Symptoms related to the physical, chemical and toxicological characteristics; (c) Delayed and immediate effects and also chronic effects from short- and long-term exposure; (d) Numerical measures of toxicity (such as acute toxicity estimates). (e) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA.
12.	**Ecological information (Non-mandatory)**	(a) Ecotoxicity (aquatic and terrestrial, where available); (b) Persistence and degradability; (c) Bioaccumulative potential; (d) Mobility in soil; (e) Other adverse effects (such as hazardous to the ozone layer).
13.	**Disposal considerations (Non-mandatory)**	Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.

	Heading	Subheading
14.	**Transport information (Non-mandatory)**	(a) UN number; (b) UN proper shipping name; (c) Transport hazard class(es); (d) Packing group, if applicable; (e) Environmental hazards (e.g., Marine pollutant (Yes/No)); (f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code); (g) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.
15.	**Regulatory information (Non-mandatory)**	Safety, health and environmental regulations specific for the product in question.
16.	**Other information, including date of preparation or last revision**	The date of preparation of the SDS or the last change to it.

ATTACHMENT B

PAINTING AND IDENTIFICATION OF PIPE AND EQUIPMENT

This is the current labeling system used by UNM FM Utilities.

Pipe shall be wrapped with colored “Scotch” brand or equal plastic tape in the color designated with a tape 12" minimum width at each point. Brady or equal paste-on labels with the designated lettering shall be pasted on the above taped section in the color and size lettering designated. Colored bands of the size and color designated shall be placed around the pipe over the basic colored tape required. These will be located for maximum visibility from expected personnel approach. Distance apart shall be a maximum of twenty feet (20') with at least one label in each space or room.

Paste-on label containing the lettering shall be sized as follows:

Table 1

Outside Diameter of Pipe or Insulation	**Height of Lettering**
Over two inches (2")	Two inches (2")
Two inches (2") and under	One-half inch (½")

A typewritten schedule of all labels used, with identification, shall be framed, under glass, and posted in the mechanical equipment room.

Table 2

Color schedule and label code:

SERVICE	**BAND COLOR & SIZE**	**LETTERING**	**PLASTIC TAPE & LABEL COLOR**
Steam	2" Black (2 required)	Steam (Black)	Yellow
Condensate Return	1" Black	Return (Black)	Yellow
Hot Water Supply	2" Orange	Heating (Black)	Yellow
(Heating) Hot Water Return (Heating)	1" Green 1" Orange & 1" Green	Water Supply Heating (Black) Water Return	Yellow
Chilled Water Supply	2" Black (2 required)	CHWS (Black)	Green
Chilled Water Return	1" Black	CHWR (Black)	Green
Domestic Hot Water Supply	1" Purple	DHWS (Black)	Green
Domestic Hot Water Return	1" Purple	DHWR (Black)	Green
Domestic Cold Water	None	CW (Black)	Green
Soft Cold Water	1 ½" Blue Strips	SCW (Black)	Green
Distilled Water	1" Blue (2 required)	DW (Black)	Green
Compressed Air	2" Orange	AIR (Black)	Green
Natural Gas	2" Black	GAS (Black)	Orange
Vacuum	1" White	VAC (Black)	Green
Freon Suction	1" Green (2 required)	RL (Black)	Orange
Freon Suction	1" Green	RS (Black)	Orange
Freon Hot Gas	2' Green	RG (Black)	Orange
Ammonia Liquid	None	AML (Black)	Yellow
Ammonia Suction	None	AMS (Black)	Yellow

Ammonia Hot Gas	None	AMG (Black)	Yellow
Sanitary Sewer	1" Black	SS (Black)	White
Acid Sewer	1" Purple	AS (Black)	White
Equipment Drains	2" Black	D (Black)	White
All Other Drains (i.e., roof leaders)	Pipes will be painted to match adjacent walls or ceilings	D (White)	Black
Wet Standpipe or Fire Main System	No Bands	Fire (White)	Black
Water Sprinkler	No Bands	SPR (White)	Red
Dry Standpipe	No Bands	SP (White)	Red
Electric Conduit	No Bands	E (White)	Blue
Fire Alarm Conduit	No Bands	FA (White)	Red
Telephone Conduit	1' White	TEL (White)	Blue
Oxygen	No Bands	OX	Black
Nitrogen	No Bands	NIT	Black
Vent	Brown	V	White

ATTACHMENT C

OSHA HAZARD COMMUNICATION, 29 CFR 1910.1200, APPENDIX A AND

OSHA'S *GUIDANCE FOR HAZARD DETERMINATION*

Health Hazard Definitions

Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g., flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees such as shortness of breath, which is a non-measurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures and are of high concentration but short duration. "Chronic" effects generally occur as a result of lower exposure levels and are of long duration.

The acute effects, such as irritation, corrosivity, sensitization and lethal dose, referred to most frequently are those defined by the American National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1988). Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposure, such as narcosis. Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity and mutagenicity. These effects are obviously a concern in the workplace, but again do not adequately cover the area of chronic effects, excluding blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy, for example.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and to be protected from them. For purposes of this section, any chemicals which meet any of the following definitions, are health hazards. However, this is not intended to be an exclusive categorization scheme. If there are available scientific data that involve other animal species or test methods, it must also be evaluated to determine the applicability of the OSHA Hazard Communication Standard.

OSHA Hazard Communication, 29 CFR 1910.1200, Appendix A

1. Acute Toxicity

Those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours.

Expressed as:

a. LD50 – Oral,dermal;

b. LC50 – Inhalation; or

c. Acute Toxicity Estimates (ATE).

2. Skin Corrosion/Irritation

2.1. Skin corrosion

The production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars. Histopathology should be considered to evaluate questionable lesions.

Skin Corrosion Category and Sub-Categories

Category 1: Corrosive	**Corrosive Sub-Categories**	**Corrosive in ≥1 of 3 animals**	
		Exposure	**Observation**
	1A	≤3 min	≤1 h.
	1B	>3 min ≤1 h	≤14 days.
	1C	>1 h ≤4 h	≤14 days.

2.2. Skin irritation (Category 1)

The production of reversible damage to the skin following the application of a test substance for up to 4 hours.

Criteria:

1. Mean value of ≥2.3 ≤4.0 for erythema/eschar or for edema in at least 2 of 3 tested animals from gradings at 24, 48 and 72 hours after patch removal or, if reactions are delayed, from grades on 3 consecutive days after the onset of skin reactions; or
2. Inflammation that persists to the end of the observation period normally 14 days in at least 2 animals, particularly taking into account alopecia (limited area), hyperkeratosis, hyperplasia, and scaling; or
3. In some cases where there is pronounced variability of response among animals, with very definite positive effects related to chemical exposure in a single animal but less than the criteria above.

3. SERIOUS EYE DAMAGE/EYE IRRITATION

3.1. Serious eye damage

The production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the anterior surface of the eye, which is not fully reversible within 21 days of application.

A substance is classified as Serious Eye Damage Category 1 (irreversible effects on the eye) when it produces:

1. at least in one tested animal, effects on the cornea, iris or conjunctiva that are not expected to reverse or have not fully reversed within an observation period of normally 21 days; and/or
2. at least in 2 of 3 tested animals, a positive response of:
    a. corneal opacity ≥3; and/or
    b. iritis >1.5;

    calculated as the mean scores following grading at 24, 48 and 72 hours after instillation of the substance.

3.2. Eye irritation

The production of changes in the eye following the application of test substance to the anterior surface of the eye, which are fully reversible within 21 days of application.

A substance is classified as Eye irritant Category 2A (irritating to eyes) when it produces in at least in 2 of 3 tested animals a positive response of:

1. corneal opacity ≥1; and/or
2. iritis ≥1; and/or
3. conjunctival redness ≥2; and/or
4. conjunctival edema (chemosis) ≥2

calculated as the mean scores following grading at 24, 48 and 72 hours after instillation of the substance, and which fully reverses within an observation period of normally 21 days.

An eye irritant is considered mildly irritating to eyes (Category 2B) when the effects listed above are fully reversible within 7 days of observation.

4. RESPIRATORY OR SKIN SENSITIZATION

4.1. Respiratory sensitizer

A chemical that will lead to hypersensitivity of the airways following inhalation of the chemical.

4.1.1. Category 1

A substance is classified as a respiratory sensitizer:

1. If there is evidence in humans that the substance can lead to specific respiratory hypersensitivity and/or
2. If there are positive results from an appropriate animal test.

4.1.2. Subcategory 1A

Substances showing a high frequency of occurrence in humans; or a probability of occurrence of a high sensitization rate in humans based on animal or other tests.1 Severity of reaction may also be considered.

4.1.3. Subcategory 1B

Substances showing a low to moderate frequency of occurrence in humans; or a probability of occurrence of a low to moderate sensitization rate in humans based on animal or other tests. Severity of reaction may also be considered.

4.2. Skin sensitizer

A chemical that will lead to an allergic response following skin contact.

4.2.1. Category 1

A substance is classified as a skin sensitizer:

1. If there is evidence in humans that the substance can lead to sensitization by skin contact in a substantial number of persons, or
2. If there are positive results from an appropriate animal test.

4.2.2. Subcategory 1A

Substances showing a high frequency of occurrence in humans and/or a high potency in animals can be presumed to have the potential to produce significant sensitization in humans. Severity of reaction may also be considered.

4.2.3. Subcategory 1B

Substances showing a low to moderate frequency of occurrence in humans and/or a low to moderate potency in animals can be presumed to have the potential to produce sensitization in humans. Severity of reaction may also be considered.

5. GERM CELL MUTAGENICITY

Mutation - a permanent change in the amount or structure of the genetic material in a cell. The term mutation applies both to heritable genetic changes that may be manifested at the phenotypic level and to the underlying DNA modifications when known (including, for example, specific base pair changes

and chromosomal translocations). The term mutagenic and mutagen will be used for agents giving rise to an increased occurrence of mutations in populations of cells and/or organisms.

Genotoxic and genotoxicity - agents or processes which alter the structure, information content, or segregation of DNA, including those which cause DNA damage by interfering with normal replication processes, or which in a non-physiological manner (temporarily) alter its replication. Genotoxicity test results are usually taken as indicators for mutagenic effects.

This hazard class is primarily concerned with chemicals that may cause mutations in the germ cells of humans that can be transmitted to the progeny. However, mutagenicity/genotoxicity tests in vitro and in mammalian somatic cells in vivo are also considered in classifying substances and mixtures within this hazard class.

5.1. Category 1

Substances known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans.

5.2. Category 1A

1. Substances known to induce heritable mutations in germ cells of humans.
2. Positive evidence from human epidemiological studies.

5.3. Category 1B

Substances which should be regarded as if they induce heritable mutations in the germ cells of humans.

1. Positive result(s) from in vivo heritable germ cell mutagenicity tests in mammals; or
2. Positive result(s) from *in vivo* somatic cell mutagenicity tests in mammals, in combination with some evidence that the substance has potential to cause mutations to germ cells. This supporting evidence may, for example, be derived from mutagenicity/genotoxicity tests in germ cells *in vivo*, or by demonstrating the ability of the substance or its metabolite(s) to interact with the genetic material of germ cells; or
3. Positive results from tests showing mutagenic effects in the germ cells of humans, without demonstration of transmission to progeny; for example, an increase in the frequency of aneuploidy in sperm cells of exposed people.

5.4. Category 2

Substances which cause concern for humans owing to the possibility that they may induce heritable mutations in the germ cells of humans.

Positive evidence obtained from experiments in mammals and/or in some cases from in vitro experiments, obtained from:

1. Somatic cell mutagenicity tests in vivo, in mammals; or

2. Other in vivo somatic cell genotoxicity tests which are supported by positive results from in vitro mutagenicity assays

6. NOTE: SUBSTANCES WHICH ARE POSITIVE IN IN VITRO MAMMALIAN MUTAGENICITY ASSAYS, AND WHICH ALSO SHOW CHEMICAL STRUCTURE ACTIVITY RELATIONSHIP TO KNOWN GERM CELL MUTAGENS, SHOULD BE CONSIDERED FOR CLASSIFICATION AS CATEGORY 2 MUTAGENS. CARCINOGENITY

Carcinogen - a substance or a mixture of substances which induce cancer or increase its incidence. Substances and mixtures which have induced benign and malignant tumors in well-performed experimental studies on animals are considered also to be presumed or suspected human carcinogens unless there is strong evidence that the mechanism of tumor formation is not relevant for humans.

Classification of a substance or mixture as posing a carcinogenic hazard is based on its inherent properties and does not provide information on the level of the human cancer risk which the use of the substance or mixture may represent.

A chemical is considered to be a carcinogen if:

1. It has been evaluated by the International Agency for Research on Cancer (IARC) and is found to be a carcinogen or potential carcinogen; or
2. It is listed as a carcinogen or potential carcinogen in the latest edition of the Annual Report on Carcinogens published by the National Toxicology Program (NTP); or
3. It is regulated by OSHA as a carcinogen.

6.1. Category 1

Known or presumed human carcinogens.

The classification of a substance as a Category 1 carcinogen is done on the basis of epidemiological and/or animal data. This classification is further distinguished on the basis of whether the evidence for classification is largely from human data (Category 1A) or from animal data (Category 1B):

6.1.1. Category 1A

Known to have carcinogenic potential for humans. Classification in this category is largely based on human evidence.

6.1.2. Category 1B

Presumed to have carcinogenic potential for humans. Classification in this category is largely based on animal evidence.

- The classification of a substance in Category 1A and 1B is based on strength of evidence together with weight of evidence considerations (See paragraph A.6.2.5). Such evidence may be derived from:
    1. Human studies that establish a causal relationship between human exposure to a substance and the development of cancer (known human carcinogen); or

2. Animal experiments for which there is sufficient evidence to demonstrate animal carcinogenicity (presumed human carcinogen).

6.2. Category 2

Suspected human carcinogens.

The classification of a substance in Category 2 is done on the basis of evidence obtained from human and/or animal studies, but which is not sufficiently convincing to place the substance in Category 1A or B. This classification is based on strength of evidence together with weight of evidence considerations (See paragraph A.6.2.5). Such evidence may be from either limited evidence of carcinogenicity in human studies or from limited evidence of carcinogenicity in animal studies.

Other considerations: Where the weight of evidence for the carcinogenicity of a substance does not meet the above criteria, any positive study conducted in accordance with established scientific principles, and which reports statistically significant findings regarding the carcinogenic potential of the substance, must be noted on the safety data sheet.

7. REPRODUCTIVE TOXICITY

Reproductive toxicity includes adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on development of the offspring. Some reproductive toxic effects cannot be clearly assigned to either impairment of sexual function and fertility or to developmental toxicity. Nonetheless, chemicals with these effects shall be classified as reproductive toxicants.

7.1. Category 1

Known or presumed human reproductive toxicant.

Substance shall be classified in Category 1 for reproductive toxicity when they are known to have produced an adverse effect on sexual function and fertility or on development in humans or when there is evidence from animal studies, possibly supplemented with other information, to provide a strong presumption that the substance has the capacity to interfere with reproduction in humans. The classification of a substance is further distinguished on the basis of whether the evidence for classification is primarily from human data (Category 1A) or from animal data (Category 1B).

7.1.1. Category 1A

Known human reproductive toxicant

The classification of a substance in this category is largely based on evidence from humans.

7.1.2. Category 1B

Presumed human reproductive toxicant

The classification of a substance in this category is largely based on evidence from experimental animals. Data from animal studies shall provide sufficient evidence of an adverse effect on sexual function and fertility or on development in the absence of other toxic effects, or if

occurring together with other toxic effects the adverse effect on reproduction is considered not to be a secondary non-specific consequence of other toxic effects. However, when there is mechanistic information that raises doubt about the relevance of the effect for humans, classification in Category 2 may be more appropriate.

7.2. Category 2

Suspected human reproductive toxicant

Substances shall be classified in Category 2 for reproductive toxicity when there is some evidence from humans or experimental animals, possibly supplemented with other information, of an adverse effect on sexual function and fertility, or on development, in the absence of other toxic effects, or if occurring together with other toxic effects the adverse effect on reproduction is considered not to be a secondary non-specific consequence of the other toxic effects, and where the evidence is not sufficiently convincing to place the substance in Category 1. For instance, deficiencies in the study may make the quality of evidence less convincing, and in view of this, Category 2 would be the more appropriate classification.

8. SPECIFIC TARGET ORGAN TOXICITY, SINGLE EXPOSURE

Specific, non-lethal target organ toxicity arising from a single exposure to a chemical. All significant health effects that can impair function, both reversible and irreversible, immediate and/or delayed and not specifically addressed in A.1 to A.7 and A.10 of Appendix A are included.

8.1. Category 1

Substances that have produced significant toxicity in humans, or that, on the basis of evidence from studies in experimental animals can be presumed to have the potential to produce significant toxicity in humans following single exposure.

Substances are classified in Category 1 for STOT-SE on the basis of:

1. Reliable and good quality evidence from human cases or epidemiological studies; or
2. Observations from appropriate studies in experimental animals in which significant and/or severe toxic effects of relevance to human health were produced at generally low exposure concentrations.

8.2. Category 2

Substances that, on the basis of evidence from studies in experimental animals, can be presumed to have the potential to be harmful to human health following single exposure.

Substances are classified in Category 2 for STOT-SE on the basis of observations from appropriate

studies in experimental animals in which significant toxic effects, of relevance to human health, were produced at generally moderate exposure concentrations.

8.3. Category 3

Transient target organ effects.

There are target organ effects for which a substance does not meet the criteria to be classified in Categories 1 or 2 indicated above. These are effects which adversely alter human function for a short duration after exposure and from which humans may recover in a reasonable period without leaving significant alteration of structure or function. This category only includes narcotic effects and respiratory tract irritation.

9. SPECIFIC TARGET ORGAN TOXICITY, REPEATED OR PROLONGED EXPOSURE

Specific target organ toxicity arising from repeated exposure to a substance or mixture. All significant health effects that can impair function, both reversible and irreversible, immediate and/or delayed and not specifically addressed in A.1 to A.7 and A.10 of Appendix A are included.

9.1. Category 1

Substances that have produced significant toxicity in humans, or that, on the basis of evidence from studies in experimental animals can be presumed to have the potential to produce significant toxicity in humans following repeated or prolonged exposure

Substances are classified in Category 1 for specific target organ toxicity (repeated exposure) on the basis of:

1. Reliable and good quality evidence from human cases or epidemiological studies; or,
2. Observations from appropriate studies in experimental animals in which significant and/or severe toxic effects, of relevance to human health, were produced at generally low exposure concentrations. Guidance dose/concentration values are provided below (See A.9.2.9) to be used as part of weight-of-evidence evaluation.

9.2. Category 2

Substances that, on the basis of evidence from studies in experimental animals can be presumed to have the potential to be harmful to human health following repeated or prolonged exposure.

Substances are classified in Category 2 for specific target organ toxicity (repeated exposure) on the basis of observations from appropriate studies in experimental animals in which significant toxic effects, of relevance to human health, were produced at generally moderate exposure concentrations. Guidance dose/concentration values are provided below (See A.9.2.9) in order to help in classification.

In exceptional cases human evidence can also be used to place a substance in Category 2.

10. ASPIRATION HAZARD

The entry of a liquid or solid chemical directly through the oral or nasal cavity, or indirectly from vomiting, into the trachea and lower respiratory system.

Aspiration toxicity includes severe acute effects such as chemical pneumonia, varying degrees of pulmonary injury or death following aspiration.

Aspiration is initiated at the moment of inspiration, in the time required to take one breath, as the causative material lodges at the crossroad of the upper respiratory and digestive tracts in the laryngopharyngeal region.

Aspiration of a substance or mixture can occur as it is vomited following ingestion. This may have consequences for labeling, particularly where, due to acute toxicity, a recommendation may be considered to induce vomiting after ingestion. However, if the substance/mixture also presents an aspiration toxicity hazard, the recommendation to induce vomiting may need to be modified.

10.1. Category 1

Chemicals known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

A substance shall be classified in Category 1:

1. If reliable and good quality human evidence indicates that it causes aspiration toxicity (See note); or
2. If it is a hydrocarbon and has a kinematic viscosity ≤20.5 mm2/s, measured at 40 °C.

OSHA's *Guidance for Hazard Determination*

The following is a target organ categorization of effects which may occur, including examples of signs, symptoms and chemicals which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.

1. Hepatotoxins: Chemicals which produce liver damage
   - Signs and Symptoms: Jaundice; liver enlargement
   - Chemicals: Carbon tetrachloride; nitrosamines
2. Nephrotoxins: Chemicals which produce kidney damage
   - Signs and Symptoms: Edema; proteinuria
   - Chemicals: Halogenated hydrocarbons; uranium
3. Neurotoxins: Chemicals which produce primary toxic effects on the nervous system

- Signs and Symptoms: Narcosis; behavioral changes; decrease in motor functions
- Chemicals: Mercury; carbon disulfide

4. Agents which act on the blood or hemato-poietic system: Decrease hemoglobin function; deprive the body tissues of oxygen
    - Signs and Symptoms: Cyanosis; loss of consciousness
    - Chemicals: Carbon monoxide; cyanides
5. Agents which damage the lung: Chemicals which irritate or damage pulmonary tissue
    - Signs and Symptoms: Cough; tightness in chest; shortness of breath
    - Chemicals: Silica; asbestos
6. Reproductive Toxins: Chemicals which affect the reproductive capabilities, including chromosomal damage (mutations) and effects on fetuses (teratogenesis)
    - Signs and Symptoms: Birth defects; sterility
    - Chemicals: Lead; DBCP
7. Cutaneous Hazards: Chemicals which affect the dermal layer of the body
    - Signs and Symptoms: Defatting of the skin; rashes; irritation
    - Chemicals: Ketones; chlorinated compounds
8. Eye Hazards: Chemicals which affect the eye or visual capacity
    - Signs and Symptoms: Conjunctivitis; corneal damage
    - Chemicals: Organic solvents; acids

ATTACHMENT D

OSHA HAZARD COMMUNICATION, 29 CFR 1910.1200, APPENDIX B

PHYSICAL CRITERIA

1. EXPLOSIVES

An explosive chemical is a solid or liquid chemical which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic chemicals are included even when they do not evolve gases.

A pyrotechnic chemical is a chemical designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions.

An explosive item is an item containing one or more explosive chemicals.

A pyrotechnic item is an item containing one or more pyrotechnic chemicals.

An unstable explosive is an explosive which is thermally unstable and/or too sensitive for normal handling, transport, or use.

An intentional explosive is a chemical or item which is manufactured with a view to produce a practical explosive or pyrotechnic effect.

1.1. Classification

Division 1.1 - Chemicals and items which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously);

Division 1.2 - Chemicals and items which have a projection hazard but not a mass explosion hazard;

Division 1.3 - Chemicals and items which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard:

1. Combustion of which gives rise to considerable radiant heat; or
2. Which burn one after another, producing minor blast or projection effects or both;

Division 1.4 - Chemicals and items which present no significant hazard: chemicals and items which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package;

Division 1.5 - Very insensitive chemicals which have a mass explosion hazard: chemicals which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions;

Division 1.6 - Extremely insensitive items which do not have a mass explosion hazard: items which contain only extremely insensitive detonating chemicals and which demonstrate a negligible probability of accidental initiation or propagation.

2. FLAMMABLE GASES

A gas having a flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi).

NOTE: Aerosols should not be classified as flammable gases.

2.1. Category 1

Gases, which at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi):

1. Are ignitable when in a mixture of 13% or less by volume in air; or
2. Have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

2.2. Category 2

Gases, other than those of Category 1, which, at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi), have a flammable range while mixed in air.

3. Flammable Aerosols

Any non-refillable receptacle containing a gas compressed, liquefied or dissolved under pressure, and fitted with a release device allowing the contents to be ejected as particles in suspension in a gas, or as a foam, paste, powder, liquid or gas.

3.1. Category 1

Contains ≥ 85% flammable components and the chemical heat of combustion is ≥30 kJ/g; or

1. For spray aerosols, in the ignition distance test, ignition occurs at a distance ≥75 cm (29.5 in), or
2. For foam aerosols, in the aerosol foam flammability test
3. The flame height is ≥ 20 cm (7.87 in) and the flame duration ≥2 s; or
4. The flame height is ≥ 4 cm (1.57 in) and the flame duration ≥7 s.

3.2. Category 2

Contains > 1% flammable components, or the heat of combustion is ≥20 kJ/g; and

1. For spray aerosols, in the ignition distance test, ignition occurs at a distance ≥15 cm (5.9 in), or in the enclosed space ignition test, the
    a. Time equivalent is ≤300 s/m3; or
    b. Deflagration density is ≤ 300 g/m3
2. For foam aerosols, in the aerosol foam flammability test, the flame height is ≥4 cm and the flame duration is ≥2 s and it does not meet the criteria for Category 1.

4. Oxidizing Gases

Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.

4.1. Category 1

Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.

5. Gases Under Pressure

Gases which are contained in a receptacle at a pressure of 200 kPa (29 psi) (gauge) or more, or which are liquefied or liquefied and refrigerated.

They comprise compressed gases, liquefied gases, dissolved gases and refrigerated liquefied gases.

5.1. Compressed Gas

A gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature ≤ 50°C (-58°F).

5.2. Liquefied Gas

A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F). A distinction is made between:

1. High pressure liquefied gas: a gas with a critical temperature between -50°C (-58°F) and +65°C (149°F); and
2. Low pressure liquefied gas: a gas with a critical temperature above +65°C (149°F).

5.3. Refrigerated Liquefied Gas

A gas which is made partially liquid because of its low temperature.

5.4. Dissolved Gas

A gas which when under pressure is dissolved in a liquid phase solvent.

6. Flammable Liquids

A liquid having a flash point of not more than 93°C (199.4°F).

Flash point - the minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

6.1. Category 1

Flash point < 23°C (73.4°F) and initial boiling point ≤ 35°C (95°F).

6.2. Category 2

Flash point < 23°C (73.4°F) and initial boiling point > 35°C (95°F).

6.3. Category 3

Flash point ≥ 23°C (73.4°F) and ≤ 60°C (140°F).

6.4. Category 4

Flash point > 60°C (140°F) and ≤ 93°C (199.4°F).

7. Flammable Solids

A solid which is a readily combustible solid, or which may cause or contribute to fire through friction.

Readily combustible solids are powdered, granular, or pasty chemicals which are dangerous if they can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly.

7.1. Category 1

Burning rate test:

Chemicals other than metal powders:

1. Wetted zone does not stop fire; and>
2. Burning time <45 s or burning rate >2.2 mm/s

Metal powders: burning time ≤5 min.

7.2. Category 2

Burning rate test:

Chemicals other than metal powders:

1. Wetted zone stops the fire for at least 4 min; and>
2. Burning time <45 s or burning rate >2.2 mm/s

Metal powders: burning time >5 min and ≤10 min.

8. Self-Reactive Chemicals

Thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes chemicals classified under Appendix B as explosives, organic peroxides, oxidizing liquids or oxidizing solids.

A self-reactive chemical is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.

A self-reactive chemical shall be considered for classification in this class unless:

1. It is classified as an explosive according to B.1 of this appendix;
2. It is classified as an oxidizing liquid or an oxidizing solid according to B.13 or B.14 of this appendix, except that a mixture of oxidizing substances which contains 5% or more of combustible organic substances shall be classified as a self-reactive chemical according to the procedure defined in B.8.2.2;
3. It is classified as an organic peroxide according to B.15 of this appendix;
4. Its heat of decomposition is less than 300 J/g; or
5. Its self-accelerating decomposition temperature (SADT) is greater than 75°C (167°F) for a 50 kg (110 lb) package.

9. PYROPHORIC LIQUIDS

Liquids which, even in small quantities, are liable to ignite within five minutes after coming into contact with air.

9.1. Category 1

The solid ignites within 5 min of coming into contact with air.

10. SELF-HEATING CHEMICALS

Solid or liquid chemicals, other than a pyrophoric liquid or solid, which, by reaction with air and without energy supply, are liable to self-heat; these chemicals differ from a pyrophoric liquid or solid in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).

10.1. Category 1

A positive result is obtained in a test using a 25 mm sample cube at 140°C (284°F).

10.2. Category 2

A negative result is obtained in a test using a 25 mm cube sample at 140°C (284°F), a positive result is obtained in a test using a 100 mm sample cube at 140°C (284°F), and:

1. The unit volume of the chemical is more than 3 m3; or
2. A positive result is obtained in a test using a 100 mm cube sample at 120°C (248°F) and the unit volume of the chemical is more than 450 liters; or
3. A positive result is obtained in a test using a 100 mm cube sample at 100°C (212°F).

11. CHEMICALS WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

Solid or liquid chemicals which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

11.1. Category 1

Any chemical which reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously, or which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 liters per kilogram of chemical over any one minute.

11.2. Category 2

Any chemical which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 liters per kilogram of chemical per hour, and which does not meet the criteria for Category 1.

11.3. Category 3

Any chemical which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 1 liter per kilogram of chemical per hour, and which does not meet the criteria for Categories 1 and 2.

12. OXIDIZING LIQUIDS

Liquids which, while of themselves not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.

12.1. Category 1

Any chemical which, in the 1:1 mixture, by mass, of chemical and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of chemical and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.

12.2. Category 2

Any chemical which, in the 1:1 mixture, by mass, of chemical and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 40% aqueous sodium chlorate solution and cellulose; and the criteria for Category 1 are not met.

12.3. Category 3

Any chemical which, in the 1:1 mixture, by mass, of chemical and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 65% aqueous nitric acid and cellulose; and the criteria for Categories 1 and 2 are not met.

For organic chemicals, the classification procedure for this class shall not be applied if:

1. The chemical does not contain oxygen, fluorine or chlorine; or
2. The chemical contains oxygen, fluorine or chlorine and these elements are chemically bonded only to carbon or hydrogen.

For inorganic chemicals, the classification procedure for this class shall not be applied if the chemical does not contain oxygen or halogen atoms.

13. OXIDIZING SOLIDS

Solids which, while themselves are not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other materials.

13.1. Category 1

Any chemical which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.

13.2. Category 2

Any chemical which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Category 1 are not met.

13.3. Category 3

Any chemical which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Categories 1 and 2 are not met.

NOTE 1: Some oxidizing solids may present explosion hazards under certain conditions (e.g., when stored in large quantities). For example, some types of ammonium nitrate may give rise to an explosion hazard under extreme conditions and the "Resistance to detonation test" (IMO: Code of Safe Practice for Solid Bulk Cargoes, 2005, Annex 3, Test 5) may be used to assess this hazard. When information indicates that an oxidizing solid may present an explosion hazard, it shall be indicated on the Safety Data Sheet.

NOTE 2: Classification of solid chemicals shall be based on tests performed on the chemical as presented. If, for example, for the purposes of supply or transport, the same chemical is to be presented in a physical form different from that which was tested and which is considered likely to materially alter its performance in a classification test, classification must be based on testing of the chemical in the new form.

For organic chemicals, the classification procedure for this class shall not be applied if:

1. The chemical does not contain oxygen, fluorine or chlorine; or
2. The chemical contains oxygen, fluorine or chlorine and these elements are chemically bonded only to carbon or hydrogen.

For inorganic chemicals, the classification procedure for this class shall not be applied if the chemical does not contain oxygen or halogen atoms.

14. ORGANIC PEROXIDES

Liquid or solid organic chemicals which contain the bivalent -0-0- structure and as such are considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term organic peroxide includes organic peroxide mixtures containing at least one organic peroxide. Organic peroxides are thermally unstable chemicals, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties:

1. Be liable to explosive decomposition;
2. Burn rapidly;
3. Be sensitive to impact or friction;
4. React dangerously with other substances.

An organic peroxide is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.

Any organic peroxide shall be considered for classification in this class, unless it contains:

1. Not more than 1.0% available oxygen from the organic peroxides when containing not more than 1.0% hydrogen peroxide; or
2. Not more than 0.5% available oxygen from the organic peroxides when containing more than 1.0% but not more than 7.0% hydrogen peroxide.

14.1. Type A

Any organic peroxide which, as packaged, can detonate or deflagrate rapidly.

14.2. Type B

Any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package.

14.3. Type C

Any organic peroxide possessing explosive properties when the chemical as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion.

14.4. Type D

Any organic peroxide which in laboratory testing meets the following criteria:

1. Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or
2. Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or
3. Does not detonate or deflagrate at all and shows a medium effect when heated under confinement.

14.5. Type E

Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement.

14.6. Type F

Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power.

15. Corrosive to Metals

A chemical which by chemical action will materially damage, or even destroy, metals.

15.1. Category 1

Corrosion rate on either steel or aluminum surfaces exceeding 6.25 mm per year at a test temperature of 55°C (131°F) when tested on both materials.

ATTACHMENT E

OSHA HAZARD COMMUNICATION, 29 CFR 1910.1200, APPENDIX C

ALLOCATION OF LABEL ELEMENTS

APPENDIX C TO §1910.1200 – ALLOCATION OF LABEL ELEMENTS (MANDATORY)

C.1 The label for each hazardous chemical shall include the product identifier used on the safety data sheet.

C.1.1 The labels on shipped containers shall also include the name, address, and telephone number of the chemical manufacturer, importer, or responsible party.

C.2 The label for each hazardous chemical that is classified shall include the signal word, hazard statement(s), pictogram(s), and precautionary statement(s) specified in C.4 for each hazard class and associated hazard category, except as provided for in C.2.1 through C.2.4.

C.2.1 Precedence of hazard information

C.2.1.1 If the signal word "Danger" is included, the signal word "Warning" shall not appear;

C.2.1.2 If the skull and crossbones pictogram is included, the exclamation mark pictogram shall not appear where it is used for acute toxicity;

C.2.1.3 If the corrosive pictogram is included, the exclamation mark pictogram shall not appear where it is used for skin or eye irritation;

C.2.1.4 If the health hazard pictogram is included for respiratory sensitization, the exclamation mark pictogram shall not appear where it is used for skin sensitization or for skin or eye irritation.

C.2.2 Hazard statement text

C.2.2.1 The text of all applicable hazard statements shall appear on the label, except as otherwise specified. The information in italics shall be included as part of the hazard statement as provided. For example: "causes damage to organs *(state all organs affected)* through prolonged or repeated exposure *(state route of exposure if no other routes of exposure cause the hazard)*". Hazard statements may be combined where appropriate to reduce the information on the label and improve readability, as long as all of the hazards are conveyed as required.

C.2.2.2 If the chemical manufacturer, importer, or responsible party can demonstrate that all or part of the hazard statement is inappropriate to a specific substance or mixture, the corresponding statement may be omitted from the label.

C.2.3 Pictograms

C.2.3.1 Pictograms shall be in the shape of a square set at a point and shall include a black hazard symbol on a white background with a red frame sufficiently wide to be clearly visible. A square red frame set at a point without a hazard symbol is not a pictogram and is not permitted on the label.

C.2.3.2 One of eight standard hazard symbols shall be used in each pictogram. The eight hazard symbols are depicted in Figure C.1. A pictogram using the exclamation mark symbol is presented in Figure C.2, for the purpose of illustration.

Figure C.1 – Hazard Symbols and Classes

Flame	Flame Over Circle	Exclamation Mark	Exploding Bomb
 Flammables Self Reactives Pyrophorics Self-heating Emits Flammable Gas Organic Peroxides	 Oxidizers	 Irritant Dermal Sensitizer Acute Toxicity (harmful) Narcotic Effects Respiratory Tract Irritation	 Explosives Self Reactives Organic Peroxides
Corrosion	**Gas Cylinder**	**Health Hazard**	**Skull and Crossbones**
 Corrosives	 Gases Under Pressure	 Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration Toxicity	 Acute Toxicity (severe)

Figure C.2 – Exclamation Mark Pictogram

C.2.3.3 Where a pictogram required by the Department of Transportation under Title 49 of the Code of Federal Regulations appears on a shipped container, the pictogram specified in C.4 for the same hazard shall not appear.

C.2.4 Precautionary statement text

C.2.4.1 There are four types of precautionary statements presented, "prevention," "response," "storage," and "disposal." The core part of the precautionary statement is presented in bold print. This is the text, except as otherwise specified, that shall appear on the label. Where additional information is required, it is indicated in plain text.

C.2.4.2 When a backslash or diagonal mark (/) appears in the precautionary statement text, it indicates that a choice has to be made between the separated phrases. In such cases, the chemical manufacturer, importer, or responsible party can choose the most appropriate phrase(s). For example, "Wear protective gloves/protective clothing/eye protection/face protection" could read "wear eye protection".

C.2.4.3 When three full stops (…) appear in the precautionary statement text, they indicate that all applicable conditions are not listed. For example, in "Use explosion-proof electrical/ventilating/lighting/.../equipment", the use of "..." indicates that other equipment may need to be specified. In such cases, the chemical manufacturer, importer, or responsible party can choose the other conditions to be specified.

C.2.4.4 When text *in italics* is used in a precautionary statement, this indicates specific conditions applying to the use or allocation of the precautionary statement. For example, "Use explosion-proof electrical/ventilating/lighting/.../equipment" is only required for flammable solids "*if dust clouds can occur*". Text in italics is intended to be an explanatory, conditional note and is not intended to appear on the label.

C.2.4.5 Where square brackets ([ ]) appear around text in a precautionary statement, this indicates that the text in square brackets is not appropriate in every case and should be used only in certain circumstances. In these cases, conditions for use explaining when the text should be used are provided. For example, one precautionary statement states: "[In case of inadequate ventilation] wear respiratory protection." This statement is given with the condition for use "– text in square brackets may be used if additional information is provided with the chemical at the point of use that explains what type of ventilation would be adequate for safe use". This means that, if additional information is provided with the chemical explaining what type of ventilation would be adequate for safe use, the text in square brackets should be used and the statement would read: "In case of inadequate ventilation wear respiratory protection." However, if the chemical is supplied without such ventilation information, the text in square brackets should not be used, and the precautionary statement should read: "Wear respiratory protection."

C.2.4.6 Precautionary statements may be combined or consolidated to save label space and improve readability. For example, "Keep away from heat, sparks and open flame," "Store in a well-ventilated place" and "Keep cool" can be combined to read "Keep away from heat, sparks and open flame and store in a cool, well-ventilated place."

C.2.4.7 In most cases, the precautionary statements are independent (e.g., the phrases for explosive hazards do not modify those related to certain health hazards, and products that are classified for both hazard classes shall bear appropriate precautionary statements for both). Where a chemical is classified for a number of hazards, and the precautionary statements are similar, the most stringent shall be included on the label (this will be applicable mainly to preventive measures). An order of precedence may be imposed by the chemical manufacturer, importer or responsible party in situations where phrases concern "Response." Rapid action may be crucial. For example, if a chemical is carcinogenic and acutely toxic, rapid action may be crucial, and first aid measures for acute toxicity will take precedence over those for long-term effects. In addition, medical attention to delayed health effects may be required in cases of incidental exposure, even if not associated with immediate symptoms of intoxication.

C.2.4.8 If the chemical manufacturer, importer, or responsible party can demonstrate that a precautionary statement is inappropriate to a specific substance or mixture, the precautionary statement may be omitted from the label.

C.3 Supplementary hazard information

C.3.1 To ensure that non-standardized information does not lead to unnecessarily wide variation or undermine the required information, supplementary information on the label is limited to when it provides further detail and does not contradict or cast doubt on the validity of the standardized hazard information.

C.3.2 Where the chemical manufacturer, importer, or distributor chooses to add supplementary information on the label, the placement of supplemental information shall not impede identification of information required by this section.

C.3.3 Where an ingredient with unknown acute toxicity is used in a mixture at a concentration $\geq$ 1%, and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required on the label.

C.4 REQUIREMENTS FOR SIGNAL WORDS, HAZARD STATEMENTS, PICTOGRAMS, AND PRECAUTIONARY STATEMENTS

C.4.1 ACUTE TOXICITY – ORAL
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**
1	Danger	Fatal if swallowed
2	Danger	Fatal if swallowed

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash …thoroughly after handling. … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If swallowed: Immediately call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see … on this label)** … Reference to supplemental first aid instruction. - *if immediate administration of antidote is required.* **Rinse mouth.**	**Store locked up.**	**Dispose of contents/container to…** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.1 ACUTE TOXICITY – ORAL (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**
3	Danger	Toxic if swallowed

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash … thoroughly after handling. … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If swallowed: Immediately call a poison center/doctor/...** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate administration of antidote is required*. **Rinse mouth.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.1 ACUTE TOXICITY – ORAL (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
4	Warning	Harmful if swallowed

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash … thoroughly after handling. … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If swallowed: Call a poison center/doctor/…/ if you feel unwell.** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Rinse mouth.**		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.2 ACUTE TOXICITY - DERMAL
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**
1	Danger	Fatal in contact with skin
2	Danger	Fatal in contact with skin

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not get in eyes, on skin, or on clothing. **Wash … thoroughly after handling.** … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.** **Wear protective gloves/protective clothing.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Wash with plenty of water/**... … Chemical manufacturer, importer, or distributor may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate. **Immediately call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate measures such as specific cleansing agent is advised*. **Take off immediately all contaminated clothing and wash it before reuse.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.2 ACUTE TOXICITY – DERMAL (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**
3	Danger	Toxic in contact with skin

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wear protective gloves/protective clothing. Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Wash with plenty of water/…** … Chemical manufacturer, importer, or distributor may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate. **Call a poison center/doctor/…/if you feel unwell.** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if measures such as specific cleansing agent is advised.* **Take off immediately all contaminated clothing and wash it before reuse.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.2 ACUTE TOXICITY – DERMAL (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
4	Warning	Harmful in contact with skin

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wear protective gloves/protective clothing. Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Wash with plenty of water...** … Chemical manufacturer, importer, or distributor may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate. **Call a poison center/doctor/…/if you feel unwell.** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if measures such as specific cleansing agent is advised.* **Take off contaminated clothing and wash it before reuse.**		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.3 ACUTE TOXICITY - INHALATION
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	Signal word	Hazard statement
1	Danger	Fatal if inhaled
2	Danger	Fatal if inhaled

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not breathe dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Use only outdoors or in a well-ventilated area.** **[In case of inadequate ventilation] Wear respiratory protection.** Chemical manufacturer, importer, or distributor to specify equipment. - *Text in square brackets may be used if additional information is provided with the chemical at the point of use that explains what type of ventilation would be adequate for safe use.*	**If inhaled: Remove person to fresh air and keep comfortable for breathing.** **Immediately call a poison center/doctor…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment is urgent (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate administration of antidote is required.*	**Store in a well-ventilated place. Keep container tightly closed.** - *if product is volatile as to generate hazardous atmosphere.* **Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.3 ACUTE TOXICITY – INHALATION (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**
3	Danger	Toxic if inhaled

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Use only outdoors or in a well-ventilated area.**	**If inhaled: Remove person to fresh air and keep comfortable for breathing.** **Call a poison center/doctor/...** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate specific measures are required*.	**Store in a well-ventilated place. Keep container tightly closed.** - *if product is volatile so as to generate hazardous atmosphere.* **Store locked up.**	**Dispose of content/container to…** … in accordance with local/regional/national/international regulations (to be specified).

C.4.3 ACUTE TOXICITY – INHALATION (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
4	Warning	Harmful if inhaled

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Use only outdoors or in a well-ventilated area.**	**If inhaled: Remove person to fresh air and keep comfortable for breathing.** **Call a poison center/doctor/…/if you feel unwell.** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice.		

C.4.4 SKIN CORROSION/IRRITATION
(Classified in Accordance with Appendix A.2)

Pictogram
Corrosion

Hazard category	**Signal word**	**Hazard statement**
1A to 1C	Danger	Causes severe skin burns and eye damage

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not breathe dusts or mists. *- if inhalable particles of dusts or mists may occur during use.* **Wash …thoroughly after handling.** **…**Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Wear protective gloves/protective clothing/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If swallowed: Rinse mouth. Do NOT induce vomiting.** **If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.** **Wash contaminated clothing before reuse.** **If inhaled: Remove person to fresh air and keep comfortable for breathing.** **Immediately call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *Manufacturer, importer, or distributor may specify a cleansing agent if appropriate.* **If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.4 SKIN CORROSION/IRRITATION (CONTINUED)
(Classified in Accordance with Appendix A.2)

Pictogram
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
2	Warning	Causes skin irritation

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash … thoroughly after handling. … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Wear protective gloves.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Wash with plenty of water**/... … Chemical manufacturer, importer, or distributor may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *Manufacturer, importer, or distributor may specify a cleansing agent if appropriate.* **If skin irritation occurs: Get medical advice/attention.** **Take off contaminated clothing and wash it before reuse.**		

C.4.5 EYE DAMAGE/IRRITATION
(Classified in Accordance with Appendix A.3)

Pictogram
Corrosion

Hazard category	**Signal word**	**Hazard statement**
1	Danger	Causes serious eye damage

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wear eye protection/face protection. Chemical manufacturer, importer, or distributor to specify type of equipment.	**If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.** **Immediately call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice.		

C.4.5 EYE DAMAGE/IRRITATION (CONTINUED)
(Classified in Accordance with Appendix A.3)

Pictogram
Exclamation mark

Hazard category	Signal word	Hazard statement
2A	Warning	Causes serious eye irritation

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash … thoroughly after handling. **…** Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Wear eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.** **If eye irritation persists: Get medical advice/attention.**		

C.4.5 EYE DAMAGE/IRRITATION (CONTINUED)
(Classified in Accordance with Appendix A.3)

Pictogram
No Pictogram

Hazard category	**Signal word**	**Hazard statement**
2B	Warning	Causes eye irritation

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash … thoroughly after handling. … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling.	**If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.** **If eye irritation persists: Get medical advice/attention.**		

C.4.6 SENSITIZATION - RESPIRATORY
(Classified in Accordance with Appendix A.4)

Pictogram
Health hazard

Hazard category	Signal word	Hazard statement
1 (including both sub-categories 1A and 1B)	Danger	May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **[In case of inadequate ventilation] wear respiratory protection.** Chemical manufacturer, importer, or distributor to specify equipment - *Text in square brackets may be used if additional information is provided with the chemical at the point of use that explains what type of ventilation would be adequate for safe use.*	**If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.** **If experiencing respiratory symptoms: Call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice.		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.7 SENSITIZATION - SKIN
(Classified in Accordance with Appendix A.4)

Pictogram
Exclamation mark

Hazard category	Signal word	Hazard statement
1 (including both sub-categories 1A and 1B)	Warning	May cause an allergic skin reaction

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Contaminated work clothing must not be allowed out of the workplace.** **Wear protective gloves.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Wash with plenty of water/**... … Chemical manufacturer, importer, or distributor may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate. **If skin irritation or rash occurs: Get medical advice/attention.** **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *Manufacturer, importer, or distributor may specify a cleansing agent if appropriate.* **Wash contaminated clothing before reuse.**		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.8 GERM CELL MUTAGENICITY
(Classified in Accordance with Appendix A.5)

Pictogram
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1A and 1B	Danger	May cause genetic defects <...>
2	Warning	Suspected of causing genetic defects <...>
		(state route of exposure if no other routes of exposure cause the hazard)

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Obtain special instructions before use. **Do not handle until all safety precautions have been read and understood.** **Wear protective gloves/protective clothing/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment, as required.	**If exposed or concerned: Get medical advice/attention.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.9 CARCINOGENICITY
(Classified in Accordance with Appendix A.6)

Pictogram
Health hazard

Hazard category	Signal word	Hazard statement
1A and 1B	Danger	May cause cancer <...>
2	Warning	Suspected of causing cancer <...>
		(state route of exposure if no other routes of exposure cause the hazard)

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Obtain special instructions before use. **Do not handle until all safety precautions have been read and understood.** **Wear protective gloves/protective clothing/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment, as required.	**If exposed or concerned: Get medical advice/attention.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

Note: If a Category 2 carcinogen ingredient is present in the mixture at a concentration between 0.1% and 1%, information is required on the SDS for a product; however, a label warning is optional. If a Category 2 carcinogen ingredient is present in the mixture at a concentration of ≥ 1%, both an SDS and a label is required and the information must be included on each.

C.4.10 TOXIC TO REPRODUCTION
(Classified in Accordance with Appendix A.7)

Pictogram
Health hazard

Hazard category	Signal word	Hazard statement
1A and 1B	Danger	May damage fertility or the unborn child <...> <<...>>
2	Warning	Suspected of damaging fertility or the unborn child <...> <<...>> *(state specific effect if known)* *(state route of exposure if no other routes of exposure cause the hazard)*

Precautionary statements

Prevention	Response	Storage	Disposal
Obtain special instructions before use. **Do not handle until all safety precautions have been read and understood.** **Wear protective gloves/protective clothing/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment, as required.	**If exposed or concerned: Get medical advice/attention.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.10 TOXIC TO REPRODUCTION (CONTINUED)
(Classified in Accordance with Appendix A.7)
(EFFECTS ON OR VIA LACTATION)

Pictogram
No Pictogram

Hazard category	**Signal word**	**Hazard statement**
No designated number	*No signal word*	May cause harm to breast-fed children

(See Table A.7.1 in Appendix A.7)

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Obtain special instructions before use. **Do not breathe dusts or mists.** - *if inhalable particles of dusts or mists may occur during use.* **Avoid contact during pregnancy/while nursing.** **Wash … thoroughly after handling.** **…**Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If exposed or concerned: Get medical advice/attention.**		

C.4.11 SPECIFIC TARGET ORGAN TOXICITY (Single Exposure) (Classified in Accordance with Appendix A.8)

Pictogram
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1	Danger	Causes damage to organs <...> <<...>> <...> *(or state all organs affected if known)* <<...>> *(state route of exposure if no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not breathe dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Wash …thoroughly after handling.** … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If exposed: Call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate measures are required.*	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.11 SPECIFIC TARGET ORGAN TOXICITY (Single Exposure) (CONTINUED)
(Classified in Accordance with Appendix A.8)

Pictogram
Health hazard

Hazard category	**Signal word**	**Hazard statement**
2	Warning	May cause damage to organs <...> <<...>> <...> *(or state all organs affected, if known)* <<...>> *(state route of exposure if no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not breathe dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Wash … thoroughly after handling.** … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If exposed or concerned: Call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice.	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.11 SPECIFIC TARGET ORGAN TOXICITY (Single Exposure) (CONTINUED)
(Classified in Accordance with Appendix A.8)

Pictogram
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
3	Warning	May cause respiratory irritation; or May cause drowsiness or dizziness

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Use only outdoors or in a well-ventilated area.**	**If inhaled: Remove person to fresh air and keep comfortable for breathing.** **Call a poison center/doctor/…/if you feel unwell.** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice.	**Store in a well-ventilated place. Keep container tightly closed.** - *if product is volatile so as to generate hazardous atmosphere.* **Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.12 SPECIFIC TARGET ORGAN TOXICITY (Repeated Exposure) (Classified in Accordance with Appendix A.9)

Pictogram
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1	Danger	Causes damage to organs <...> through prolonged or repeated exposure <<...>> <...> *(state all organs affected, if known)* <<...>> *(state route of exposure if no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not breathe dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Wash … thoroughly after handling.** …Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**Get medical advice/attention if you feel unwell.**		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.12 SPECIFIC TARGET ORGAN TOXICITY (Repeated Exposure) (CONTINUED)
(Classified in Accordance with Appendix A.9)

Pictogram
Health hazard

Hazard category	**Signal word**	**Hazard statement**
2	Warning	May cause damage to organs <...> through prolonged or repeated exposure <<...>> <...> *(state all organs affected, if known)* <<...>> *(state route of exposure if no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not breathe dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions.	**Get medical advice/attention if you feel unwell.**		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.13 ASPIRATION HAZARD
(Classified in Accordance with Appendix A.10)

Pictogram
Health hazard

Hazard category	Signal word	Hazard statement
1	Danger	May be fatal if swallowed and enters airways

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
	If swallowed: Immediately call a poison center/doctor/… … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Do NOT induce vomiting.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.14 EXPLOSIVES
(Classified in Accordance with Appendix B.1)

Pictogram
Exploding bomb

Hazard category	Signal word	Hazard statement
Unstable explosive	Danger	Unstable explosive

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Obtain special instructions before use. **Do not handle until all safety precautions have been read and understood.** **Wear personal protective equipment/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment, as required.	**Explosion risk in case of fire.** **Do NOT fight fire when fire reaches explosives.** **Evacuate area.**	**Store ...** …in accordance with local/regional/ national/international regulations (to be specified).	**Dispose of contents/container to ...** …in accordance with local/regional/ national/international regulations (to be specified).

C.4.14 EXPLOSIVES (CONTINUED)
(Classified in Accordance with Appendix B.1)

Pictogram
Exploding bomb

Hazard category	Signal word	Hazard statement
Division 1.1	Danger	Explosive; mass explosion hazard
Division 1.2	Danger	Explosive; severe projection hazard
Division 1.3	Danger	Explosive; fire, blast or projection hazard

Precautionary statements

Prevention	Response	Storage	Disposal
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep wetted with...** … Chemical manufacturer, importer, or distributor to specify appropriate material. - *if drying out increases explosion hazard, except as needed for manufacturing or operating processes (e.g., nitrocellulose).* **Ground/bond container and receiving equipment.** - *if the explosive is electrostatically sensitive.* **Do not subject to grinding/shock/…/friction.** …Chemical manufacturer, importer, or distributor to specify applicable rough handling. **Wear face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: evacuate area.** **Explosion risk in case of fire.** **Do NOT fight fire when fire reaches explosives.**	**Store ...** …in accordance with local/regional/national/ international regulations (to be specified).	**Dispose of contents/container to ...** … in accordance with local/ regional/national/ international regulations (to be specified).

Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.

C.4.14 EXPLOSIVES (CONTINUED)
(Classified in Accordance with Appendix B.1)

Pictogram
Exploding bomb[1]

Hazard category	**Signal word**	**Hazard statement**
Division 1.4	Warning	Fire or projection hazard

Precautionary statements[1]			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Ground/bond container and receiving equipment.** - *if the explosive is electrostatically sensitive.* **Do not subject to grinding/shock/…/friction.** Chemical manufacturer, importer, or distributor to specify applicable rough handling. **Wear face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Evacuate area.** **Explosion risk in case of fire.** - *except if explosives are 1.4S ammunition and components thereof.* **Do NOT fight fire when fire reaches explosives.** **Fight fire with normal precautions from a reasonable distance** - *if explosives are 1.4S ammunition and components thereof.*	**Store ...** …in accordance with local/regional/ national/internation al regulations (to be specified).	**Dispose of contents/container to...** … in accordance with local/regional/national/i nternational regulations (to be specified).

Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.[1]

[1] *Except no pictogram is required for explosives that are 1.4S small arms ammunition and components thereof. Labels for 1.4S small arms ammunition and components shall include appropriate precautionary statements.*

C.4.14 EXPLOSIVES (CONTINUED)
(Classified in Accordance with Appendix B.1)

Pictogram
No pictogram

Hazard category	Signal word	Hazard statement
Division 1.5	Danger	May mass explode in fire

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. **- No smoking**. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep wetted with**... … Chemical manufacturer, importer, or distributor to specify appropriate material. - *if drying out increases explosion hazard, except as needed for manufacturing or operating processes (e.g., nitrocellulose).* **Ground/bond container and receiving equipment** - *if the explosive is electrostatically sensitive*. **Do not subject to grinding/shock/…/friction**. **…**Chemical manufacturer, importer, or distributor to specify applicable rough handling. **Wear face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Evacuate area.** **Explosion risk in case of fire.** **Do NOT fight fire when fire reaches explosives.**	**Store ...** …in accordance with local/regional/ national/international regulations (to be specified).	**Dispose of contents/container to ...** … in accordance with local/regional/ national/international regulations (to be specified).

Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.

C.4.14 EXPLOSIVES (CONTINUED)
(Classified in Accordance with Appendix B.1)

Pictogram
No pictogram

Hazard category	**Signal word**	**Hazard statement**
Division 1.6	*No signal word*	*No hazard statement*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
None assigned	None assigned	None assigned	None assigned

Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.

C.4.15 FLAMMABLE GASES
(Classified in Accordance with Appendix B.2)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Extremely flammable gas

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. -No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s).	**Leaking gas fire: Do not extinguish, unless leak can be stopped safely.** **Eliminate all ignition sources if safe to do so.**	**Store in well-ventilated place.**	

C.4.15 FLAMMABLE GASES (CONTINUED)
(Classified in Accordance with Appendix B.2)

Pictogram
No Pictogram

Hazard category	Signal word	Hazard statement
2	Warning	Flammable gas

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. -No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition sources(s).	**Leaking gas fire: Do not extinguish, unless leak can be stopped safely.** **Eliminate all ignition sources if safe to do so.**	**Store in well-ventilated place.**	

C.4.16 FLAMMABLE AEROSOLS
(Classified in Accordance with Appendix B.3)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Extremely flammable aerosol
2	Warning	Flammable aerosol

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. -No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition sources(s). **Do not spray on an open flame or other ignition source.** **Pressurized container: Do not pierce or burn, even after use.**		**Protect from sunlight. Do not expose to temperatures exceeding 50 ºC/122 ºF.**	

C.4.17 OXIDIZING GASES
(Classified in Accordance with Appendix B.4)

Pictogram
Flame over circle

Hazard category	Signal word	Hazard statement
1	Danger	May cause or intensify fire; oxidizer

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep/Store away from clothing/…/combustible materials. …Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Keep reduction valves/valves and fittings free from oil and grease.**	**In case of fire: Stop leak if safe to do so.**	**Store in well-ventilated place.**	

C.4.18 GASES UNDER PRESSURE
(Classified in Accordance with Appendix B.5)

Pictogram
Gas cylinder

Hazard category	Signal word	Hazard statement
Compressed gas	Warning	Contains gas under pressure; may explode if heated
Liquefied gas	Warning	Contains gas under pressure; may explode if heated
Dissolved gas	Warning	Contains gas under pressure; may explode if heated

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
		Protect from sunlight. Store in a well-ventilated place.	

C.4.18 GASES UNDER PRESSURE (CONTINUED)
(Classified in Accordance with Appendix B.5)

Pictogram
Gas cylinder

Hazard category	Signal word	Hazard statement
Refrigerated liquefied gas	Warning	Contains refrigerated gas; may cause cryogenic burns or injury

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wear cold insulating gloves/face shield/eye protection.	**Thaw frosted parts with lukewarm water. Do not rub affected area.** **Get immediate medical advice/attention**	**Store in well-ventilated place.**	

C.4.19 FLAMMABLE LIQUIDS
(Classified in Accordance with Appendix B.6)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Extremely flammable liquid and vapor
2	Danger	Highly flammable liquid and vapor
3	Warning	Flammable liquid and vapor

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces.– No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep container tightly closed.** **Ground/Bond container and receiving equipment** - *if electrostatically sensitive material is for reloading.* - *if product is volatile so as to generate hazardous atmosphere.* **Use explosion-proof electrical/ventilating/ lighting/.../equipment.** ... Chemical manufacturer, importer, or distributor to specify other equipment. **Use only non-sparking tools.** **Take precautionary measures against static discharge.** **Wear protective gloves/eye protection/face protection** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.** **In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store in a well-ventilated place. Keep cool.**	**Dispose of contents/container to...** … in accordance with local/regional/national/ international regulations (to be specified).

C.4.19 FLAMMABLE LIQUIDS (CONTINUED)
(Classified in Accordance with Appendix B.6)

Pictogram
No Pictogram

Hazard category	Signal word	Hazard statement
4	Warning	Combustible liquid

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from flames and hot surfaces. – No smoking. **Wear protective gloves/eye protection/face protection** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store in a well-ventilated place. Keep cool.**	**Dispose of contents/container to...** in accordance with local/regional/ national/international regulations (to be specified).

C.4.20 FLAMMABLE SOLIDS
(Classified in Accordance with Appendix B.7)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Flammable solid
2	Warning	Flammable solid

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Ground/Bond container and receiving equipment.** - *if electrostatically sensitive material is for reloading.* **Use explosion-proof electrical/ventilating/ lighting/... /equipment.** ... Chemical manufacturer, importer, or distributor to specify other equipment. - *if dust clouds can occur.* **Wear protective gloves/eye protection/face protection** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*		

C.4.21 SELF-REACTIVE SUBSTANCES AND MIXTURES (Classified in Accordance with Appendix B.8)

Pictogram
Exploding bomb

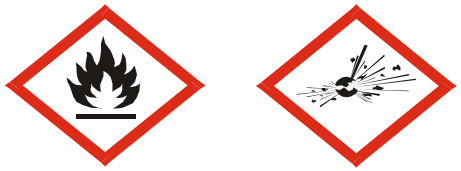
Hazard category	Signal word	Hazard statement
Type A	Danger	Heating may cause an explosion

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep/Store away from clothing/…/combustible materials.** **...** Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Keep only in original container.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.* **In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.**	**Store in a well-ventilated place. Keep cool.** **Store at temperatures not exceeding …°C/…°F.** ... Chemical manufacturer, importer, or distributor to specify temperature. **Store away from other materials.**	**Dispose of contents/container to...** … in accordance with local/regional/national/international regulations (to be specified).

C.4.21 SELF-REACTIVE SUBSTANCES AND MIXTURES (CONTINUED)
(Classified in Accordance with Appendix B.8)

Hazard category	Signal word	Hazard statement
Type B	Danger	Heating may cause a fire or explosion

Pictograms
Exploding bomb and flame



Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep/Store away from clothing/.../combustible materials.** ... Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Keep only in original container.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.* **In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.**	**Store in a well-ventilated place. Keep cool.** **Store at temperatures not exceeding …°C/…°F.** ... Chemical manufacturer, importer, or distributor to specify temperature. **Store away from other materials.**	**Dispose of contents/container to**... …in accordance with local/regional/national/international regulations (to be specified).

C.4.21 SELF-REACTIVE SUBSTANCES AND MIXTURES(CONTINUED)
(Classified in Accordance with Appendix B.8)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
Type C	Danger	Heating may cause a fire
Type D	Danger	Heating may cause a fire
Type E	Warning	Heating may cause a fire
Type F	Warning	Heating may cause a fire

Precautionary statements

Prevention	Response	Storage	Disposal
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep/Store away from clothing/…/combustible materials.** …Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Keep only in original container.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store in a well-ventilated place. Keep cool.** **Store at temperatures not exceeding …°C/…°F.** ...Chemical manufacturer, importer, or distributor to specify temperature. **Store away from other materials.**	**Dispose of contents/container to...** …in accordance with local/regional/national/international regulations (to be specified).

C.4.22 PYROPHORIC LIQUIDS
(Classified in Accordance with Appendix B.9)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Catches fire spontaneously if exposed to air

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition sources(s). **Do not allow contact with air.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Immerse in cool water/wrap with wet bandages** **In case of fire: Use ... to extinguish** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store contents under ...** ... Chemical manufacturer, importer, or distributor to specify appropriate liquid or inert gas.	

C.4.23 PYROPHORIC SOLIDS
(Classified in Accordance with Appendix B.10)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Catches fire spontaneously if exposed to air

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Do not allow contact with air.** **Wear protective gloves/eye protection/face protection** Chemical manufacturer, importer, or distributor to specify type of equipment.	**Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.** **In case of fire: Use ... to extinguish** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store contents under ...** …Chemical manufacturer, importer, or distributor to specify appropriate liquid or inert gas.	

C.4.24 SELF-HEATING SUBSTANCES AND MIXTURES
(Classified in Accordance with Appendix B.11)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Self-heating; may catch fire
2	Warning	Self-heating in large quantities; may catch fire

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep cool. Protect from sunlight. **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.		**Maintain air gap between stacks/pallets.** **Store bulk masses greater than … kg/…lbs at temperatures not exceeding …°C/…°F.** ... Chemical manufacturer, importer, or distributor to specify mass and temperature. **Store away from other materials.**	

C.4.25 SUBSTANCES AND MIXTURES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES (Classified in Accordance with Appendix B.12)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	In contact with water releases flammable gases, which may ignite spontaneously
2	Danger	In contact with water releases flammable gas

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not allow contact with water. **Handle under inert gas. Protect from moisture.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**Brush off loose particles from skin and immerse in cool water/wrap in wet bandages.** **In case of fire: Use ... to extinguish** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store in a dry place. Store in a closed container.**	**Dispose of contents/container to...** …in accordance with local/regional/national/ international regulations (to be specified).

C.4.25 SUBSTANCES AND MIXTURES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES (CONTINUED)

(Classified in Accordance with Appendix B.12)

Hazard category	Signal word	Hazard statement
3	Warning	In contact with water releases flammable gas

Pictogram

Flame

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Handle under inert gas. Protect from moisture. **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*	**Store in a dry place. Store in a closed container.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.26 OXIDIZING LIQUIDS
(Classified in Accordance with Appendix B.13)

Pictogram
Flame over circle

Hazard category	Signal word	Hazard statement
1	Danger	May cause fire or explosion; strong oxidizer

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat. **Keep/Store away from clothing and other combustible materials.** **Take any precaution to avoid mixing with combustibles/...** ... Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Wear protective gloves /eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment. **Wear fire/flame resistant/retardant clothing.**	**If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.** **In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.** **In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*		**Dispose of contents/container to...** …in accordance with local/regional/ national/international regulations (to be specified).

C.4.26 OXIDIZING LIQUIDS (CONTINUED)
(Classified in Accordance with Appendix B.13)

Pictogram
Flame over circle

Hazard category	Signal word	Hazard statement
2	Danger	May intensify fire; oxidizer
3	Warning	May intensify fire; oxidizer

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat. **Keep/Store away from clothing/…/combustible materials.** **…**Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Take any precaution to avoid mixing with combustibles/...** ... Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*		**Dispose of contents/container to...** …in accordance with local/regional/ national/international regulations (to be specified).

C.4.27 OXIDIZING SOLIDS
(Classified in Accordance with Appendix B.14)

Pictogram
Flame over circle

Hazard category	Signal word	Hazard statement
1	Danger	May cause fire or explosion; strong oxidizer

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat. **Keep away from clothing and other combustible materials.** **Take any precaution to avoid mixing with combustibles/...** …Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment. **Wear fire/flame resistant/retardant clothing.**	**If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.** **In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.** **In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*		**Dispose of contents/container to...** …in accordance with local/regional/ national/international regulations (to be specified).

C.4.27 OXIDIZING SOLIDS (CONTINUED)
(Classified in Accordance with Appendix B.14)

Pictogram
Flame over circle

Hazard category	Signal word	Hazard statement
2	Danger	May intensify fire; oxidizer
3	Warning	May intensify fire; oxidizer

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat. **Keep/Store away from clothing/…/ combustible materials.** … Chemical manufacturer, importer, or distributor to specify incompatible materials. **Take any precaution to avoid mixing with combustibles/...** …Chemical manufacturer, importer, or distributor to specify other incompatible materials. **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**In case of fire: Use ... to extinguish.** ... Chemical manufacturer, importer, or distributor to specify appropriate media. - *if water increases risk.*		**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.28 ORGANIC PEROXIDES
(Classified in Accordance with Appendix B.15)

Pictogram
Exploding bomb

Hazard category	Signal word	Hazard statement
Type A	Danger	Heating may cause an explosion

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces.- No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep/Store away from clothing/…/combustible materials.** ... Chemical manufacturer, importer, or distributor to specify incompatible materials. **Keep only in original container.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.		**Store at temperatures not exceeding …°C/…°F. Keep cool.** ... Chemical manufacturer, importer, or distributor to specify temperature. **Protect from sunlight.** **Store away from other materials.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.28 ORGANIC PEROXIDES (CONTINUED)
(Classified in Accordance with Appendix B.15)

Hazard category	Signal word	Hazard statement
Type B	Danger	Heating may cause a fire or explosion

Pictograms

Exploding bomb and flame

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep /Store away from clothing/.../combustible materials.** ... Chemical manufacturer, importer, or distributor to specify incompatible materials. **Keep only in original container.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.		**Store at temperatures not exceeding …°C/…°F. Keep cool.** Chemical manufacturer, importer, or distributor to specify temperature. **Protect from sunlight.** **Store away from other materials.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.28 ORGANIC PEROXIDES (CONTINUED)
(Classified in Accordance with Appendix B.15)

Pictogram

Flame

Hazard category	Signal word	Hazard statement
Type C	Danger	Heating may cause a fire
Type D	Danger	Heating may cause a fire
Type E	Warning	Heating may cause a fire
Type F	Warning	Heating may cause a fire

Precautionary statements

Prevention	Response	Storage	Disposal
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). **Keep/Store away from clothing/.../ combustible materials** ... Chemical manufacturer, importer, or distributor to specify incompatible materials. **Keep only in original container.** **Wear protective gloves/eye protection/face protection.** Chemical manufacturer, importer, or distributor to specify type of equipment.		**Store at temperatures not exceeding …°C/…°F. Keep cool.** ... Chemical manufacturer, importer, or distributor to specify temperature. **Protect from sunlight.** **Store away from other materials.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.29 CORROSIVE TO METALS
(Classified in Accordance with Appendix B.16)

Pictogram
Corrosion

Hazard category	Signal word	Hazard statement
1	Warning	May be corrosive to metals

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep only in original container.	**Absorb spillage to prevent material damage.**	**Store in corrosive resistant/... container with a resistant inner liner.** ... Chemical manufacturer, importer, or distributor to specify other compatible materials.	

C.4.30 Label elements for OSHA defined hazards

Hazard	Signal word	Hazard statement	Pictogram
Pyrophoric Gas	Danger	Catches fire spontaneously if exposed to air	Flame 
Simple Asphyxiant	Warning	May displace oxygen and cause rapid suffocation	*No Pictogram*
Combustible Dust[2]	Warning	May form combustible dust concentrations in air	*No Pictogram*

[2] *The chemical manufacturer or importer shall label chemicals that are shipped in dust form, and present a combustible dust hazard in that form when used downstream, under paragraph (f)(1); 2) the chemical manufacturer or importer shipping chemicals that are in a form that is not yet a dust must provide a label to customers under paragraph (f)(4) if, under normal conditions of use, the chemicals are processed in a downstream workplace in such a way that they present a combustible dust hazard; and 3) the employer shall follow the workplace labeling requirements under paragraph (f)(6) where combustible dust hazards are present.*

Hazard Communication Program

Final Audit Report 2021-02-18

Created:	2021-02-18
By:	Viktor Gough (vgough@unm.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAAnxCWG_eQMlNZMhe4m7rAxZ5h1lfV7c9O

"Hazard Communication Program" History

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2021-01-29 - 9:07:31 PM GMT- IP address: 129.24.33.103

Document created by Viktor Gough (vgough@unm.edu)
2021-02-18 - 9:09:53 PM GMT- IP address: 129.24.33.103

Document emailed to Casey Hall (cbhall4@unm.edu) for signature
2021-02-18 - 9:10:52 PM GMT

Document e-signed by Casey Hall (cbhall4@unm.edu)
Signature Date: 2021-02-18 - 9:33:26 PM GMT - Time Source: server- IP address: 174.62.4.62

Agreement completed.
2021-02-18 - 9:33:26 PM GMT