
HAZARD

COMMUNICATION

PROGRAM (HAZCOM)

UNIVERSITY OF HAWAII AT MANOA

Environmental Health and Safety Office

2040 East-West Road

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HAZARD COMMUNICATION PROGRAM

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1.0 Introduction

The University of Hawaii is committed to providing a safe and healthful environment for all employees. Consistent with this commitment, we have developed this Hazard Communication Program.

One of our primary concerns is the safe handling and use of chemicals throughout the University to minimize or prevent potential exposure. Potential hazards in the environment include materials that cause fire or explosion or result in injury by inhalation, skin or eye contact, or ingestion. One of the benefits of this program is that workers will know the hazards of the chemicals they are working with. This program introduces a set of procedures designed to minimize the risk of chemical exposure and keep us in compliance with the State of Hawaii Division of Occupational Safety and Health (HIOSH) Hazard Communication Standard (HAZCOM). In keeping with this program, the health of the worker is a primary concern.

The written HAZCOM program is provided to each department and includes the following:

- Description of how labels, Safety Data Sheets (SDSs) and training are used to inform employees
- Description of the method the University uses to inform employees about the hazards of non-routine tasks and unlabeled pipes

- Description of how the University informs contractors of hazardous substances that they may encounter
- Standardized form for chemical inventory listing to be followed by each supervisor

This written program is available for review by any interested employee, or representative of any employee. Any questions about this program should be addressed to the EHSO. This program is monitored and audited by the EHSO to ensure that the policies are carried out and that the program is effective.

This program includes the provisions of the United Nations Globally Harmonized System Classification and Labeling of Chemicals (GHS). The GHS provides a single set of harmonized criteria for classifying chemicals according to their health and physical hazards and specifies hazard communication elements for labeling and safety data sheets (SDSs).

1.0 Program Administration

Each department shall be responsible for implementing the provisions of this program. All training required under the standard shall be provided at no cost to the employee.

The Industrial Hygienist from the UHM EHSO shall assist the departments with the implementation and maintenance of the HAZCOM program.

3.0 An overview of the Program

The HAZCOM program consists of the following elements:

1. Inventory of Hazardous Chemicals

An inventory of all hazardous chemicals is developed. The inventory is to be updated at least annually, with obsolete items removed and new items added as necessary.

2. Safety Data Sheets (SDS)

Obtain, file, update and place SDS in appropriate work areas for each chemical in the inventory.

3. Warning Labels on All Containers of Hazardous Materials

Label all containers of chemicals with both the contents of the containers and hazard warnings.

4. Hazard Communication Training

Train employees on the elements of the HAZCOM Program.

4.0 Hazardous Substance Inventory

Each department is responsible for maintaining an inventory of all chemicals used in its operation. Appendix A provides a list of substances considered to be hazardous.

The name on the inventory form should correspond to the product identity found on the label and SDS. The hazardous materials inventory form provided in Exhibit 1A may be used by the department. The inventory list indicates if the substance has an appropriate label and if the SDS is on site.

4.1 Updating the Inventory Lists

Inventories are to be kept current. Once a list has been compiled, it must be updated. The updating should take into account two (2) changes:

- Products that are no longer used (providing that on-hand stocks have been used up)
- New products that have been added annually

5.0 Labels

5.1 Requirement on Original Containers

All containers of hazardous substances must be labeled to provide HAZCOM information. The manufacturer, distributor or importer is responsible for labeling their products prior to shipment to their customer.

Under the GHS, labels must include:

- Pictograms/symbols - This includes the harmonized hazard symbols plus other graphic elements, such as borders,

background pattern of colors which are intended to convey specific information. (Refer to Appendix B)

- Signal Words - This includes “Danger” for the more severe hazards, and “Warning” for the less severe hazards.
- Hazard Statement - These statements are standardized and assigned phrases that describe the hazard(s) as determined by hazard classification. An appropriate statement for each GHS hazard should be included on the label for products possessing more than one hazard.
- Precautionary statement - This supplements the hazard information by providing measures to be taken to minimize or prevent adverse effects from physical, health or environmental hazards. Information on first aid is included in precautionary information.
- Product Identifier - This discloses the ingredient(s) and should match that found in the SDS. For mixtures/alloys, this section should include the chemical identities of all ingredients that contribute to the acute toxicity, skin corrosion or serious eye damage, germ cell mutagenicity, carcinogenicity, reproductive toxicity, skin and respiratory sensitization, or target organ systemic toxicity (TOST), when these hazards appear on the label.

- Supplier Information - This includes the name, address and telephone number of the manufacturer or supplier.
- Supplement Information - This is not required or specified under the GHS labeling requirements, however additional information may be included at the discretion of the manufacturer/distributor. This information may be used to clarify and validate the hazard information.

Correct labeling is verified upon receipt of any chemical material by the receiving department. If the receiving department has any questions as to the acceptability of a label, questions may be addressed to the EHSO.

5.2 Incomplete or Missing Labels

If a material is received with inadequate labeling, the department is responsible for notifying the supplier and acquiring an acceptable label. The supervisor is responsible for ensuring that chemicals in the work are appropriately labeled.

5.3 Secondary Containers

Containers in the workplace must be labeled with either the labels required on original containers or product identifier and words, pictures, symbols or combination thereof, which provide general information on the hazard(s) of the chemicals, including specific information on the physical and health hazards.

Signs, placards, operating procedures or other such written materials in lieu of affixing labels to individual process containers may be used as long as the alternative method identifies the container to which it is applicable and conveys the appropriate hazard information.

Secondary or portable containers intended for immediate use (within an 8-hour work shift), do not need to be labeled.

5.4 Use of Labels

Labels are intended to be an immediate warning and a reminder of the information provided by the SDS and training program. The labels should be read before the chemicals are handled. If the precautions specified by the label are unfamiliar, employees are encouraged to consult the SDS for further information or contact their supervisor or the EHSO.

6.0 Safety Data Sheets (SDS)

6.1 Information Requirements

As with labels on original containers, SDS are prepared by the manufacturer, distributor or importer of products containing hazardous substances. The SDS provide detailed information about the product as listed below:

- a) Section 1: Identification
- b) Section 2: Hazard(s) Identification
- c) Section 3: Composition/Information on ingredients

- d) Section 4: First-Aid Measures
- e) Section 5: Fire-fighting Measures
- f) Section 6: Accident Release Information
- g) Section 7: Handling and Storage
- h) Section 8: Exposure Controls/Personal Protection
- i) Section 9: Physical and chemical Properties
- j) Section 10: Stability and Reactivity
- k) Section 11: Toxicological Information
- l) Section 12: Ecological Information
- m) Section 13: Disposal Consideration
- n) Section 14: Transport Information
- o) Section 15: Regulatory Information
- p) Section 16: Other Information, including date of preparation or last revision

We rely on the manufacturer, importer or distributor to classify the hazards of materials. Hazard classification information is provided on the SDS. The HAZCOM Standard requires all chemical manufacturers and distributors of hazardous chemicals to furnish a SDS with each initial shipment to each location and furnish new SDS information.

6.2 Location and Accessibility of Safety Data Sheets

Each supervisor is responsible for maintaining copies of SDS for their products. Since employees in some departments are highly mobile, copies of SDS may be available at a centralized location and must be readily available to employees during all hours of operation. Electronic access and other alternatives to maintaining paper copies of SDS are permitted as long as no barrier to immediate employee access in each workplace are created by such options. SDSs are also available to medical personnel; State and Federal Occupational Safety and Health officials, and EHSO personnel. Employees are encouraged to refer to the SDS for information on products in their work area.

6.3 Obtaining Safety Data Sheets

For new materials or materials without a SDS on file, the purchase order should include a statement requiring that a SDS accompany shipment of hazardous materials. All SDS received by each department must be reviewed for completeness and included into the SDS file by the supervisor. If a SDS is not available in the department files, then the department must send a letter to the manufacturer.

A new material cannot be distributed or used until the department has received the SDS and communicated the SDS information to the employees.

6.4 Incomplete or Missing Safety Data Sheet

If the SDS is missing or incomplete the department should send a letter to the manufacturer requesting one.

If no response is received within twenty five (25) working days to the request, a copy of the request with a notation that no response has been received is sent to EHSO.

The department shall keep copies of all correspondence and request letters on file.

7.0 Training

7.1 Employee Training

Each supervisor provides employee training to their employees upon their assignment to a work area where hazardous substances are present. The information provided during this session includes the following:

- The requirements of the HAZCOM Standard, including all employee's rights to information and non-discrimination
- An explanation of the SDS and information it contains
- The location and availability of the written HAZCOM program and SDSs
- How to read labels and how to use the information they contain

- Operations in the work area where hazardous substances are present
- The physical and health hazards of the chemicals in the work area
- Methods and observation techniques used to detect the presence and release of hazardous substance in the work area
- Measures employees can take to protect themselves from and minimize exposure to hazardous substances
- An explanation of the labels received on shipped containers and the workplace labeling system used
- An explanation on safety data sheet, including the order of information and how employees can obtain and use the appropriate hazard information.

The EHSO provides general HAZCOM training and a detailed outline of the training is provided in Exhibit 1B.

7.2 Refresher/On-going Training

When new hazardous substances are introduced and/or new hazard information becomes available on the materials used in the work area, the supervisor reviews with their employees the items outlined in Section 7.1 (as applicable).

The supervisor should contact EHSO if employees have questions they cannot answer.

7.3 Documentation

Each department must maintain a list of each employee who has completed HAZCOM training. This list, along with the training date and contents of the training is kept on file in the department and in each employee's personnel file. The form in Exhibit 1C may be used to document training.

8.0 Non-routine Tasks

Occasionally, employees may be required to do jobs which are not part of their everyday work schedule. These jobs are termed non-routine tasks.

Each supervisor is responsible for informing employees of the hazards associated with the specific task prior to performance of the assigned project. The information provided by the supervisor includes:

- Chemical and physical hazards of the job
- Precautionary measures to be taken
- Available control measures
- Personal protective equipment required
- Emergency procedures

Examples of non-routine tasks that may be performed by employees include cleanup of spills, asbestos removal and other tasks.

9.0 Chemicals in Unlabeled Pipes

Prior to starting work on unlabeled pipes, employees are required to contact their supervisor for information on:

- Chemicals in the pipe
- Potential hazards
- Safety precautions that must be taken

10.0 Informing Contractors

Independent contractors may work at the University in areas where hazardous substances are used. To ensure that contractors work safely, they are given the following information by the University contact person.

- List of the hazardous substances to which they may be exposed while performing their work
- Explanation of the precautions their employees may take to lessen the risk of exposure

Additionally, the University requires contractors to provide SDS for the chemicals they bring on site. The SDS must be submitted to the Facilities Project Manager and must be available for EHSO review as needed.

APPENDIX A

APPENDIX A

LISTING HAZARDOUS CHEMICALS

Determining whether a chemical is considered “hazardous” under the GHS classification system is a complex system with data obtained from test, literature, and practical experience. OSHA’s Hazard Communication Standard (29 CFR1910.1200), Appendix A (Health Hazard Criteria) and Appendix B (Physical Criteria) , which are both mandatory, detail how substances are classified as hazardous.

Determination of a chemical’s hazard classification is the responsibility of the chemical manufacturer or importer of the chemical. As a user of chemicals, you may rely on the evaluation received from these suppliers through labels on containers and SDS.

Appendix C, “Table of Chemical Hazards”, list hazardous substances based on the following:

- Regulated by OSHA in 29 CFR Part 1910 Subpart Z
- Included in the American Conference of Governmental Industrial Hygienist (ACGIH) latest edition of Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents in the Work Environment
- Listed in the National Toxicology Program’s Annual Report on Carcinogens
- Listed in the International Agency for Research on Cancer (IARC) monographs

Mixtures

If a mixture is not evaluated specifically by the manufacturer or importer, assume it is hazardous if the mixture meets any of the following:

- Contains 1% or more of any chemical in the list
- Contains 0.1% or greater of a carcinogen
- Under conditions of use, the mixture could release concentrations that exceed recommended or legal exposure limits of any component.

Mixtures produced by work operations such as fumes, vapors or dusts should also be evaluated using these guidelines.

CONSUMER PRODUCTS

Consumer products purchased for employee use are considered hazardous if they fit the definition of hazardous chemical(s).

HOW TO LIST CHEMICALS IN THE WORKPLACE

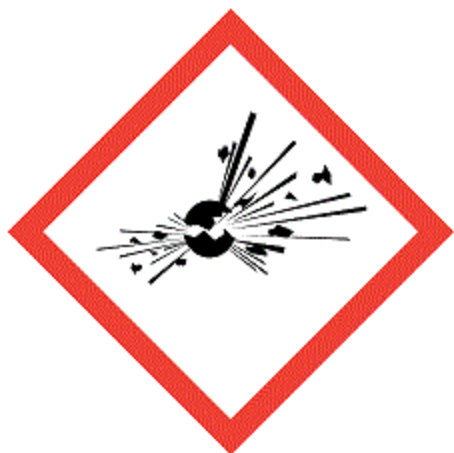
- List all hazardous chemicals known to be present in your workplace. Use a name that appears both on the SDS and the container label. A convenient form is provided in Exhibit 1A.
- The list is to be an inventory of everything for which a SDS must be obtained. It will be part of the written program, and must be available to employees upon request.
- In addition to obvious chemicals such as solvents, one should also include commercial products such as adhesives, aerosols, cleaning agents, detergents, glues, inks, janitorial supplies, paints and surfactants.

APPENDIX B

APPENDIX B

GHS PICTOGRAMS AND WHAT THEY MEAN

1. Exploding Bomb



This chemical can blow up.

2. Flame



Flammable chemicals can catch fire easily and burst into flames.

3. Corrosion



Corrosive chemicals can cause serious damage to the skin and eyes. They can also eat away clothing, metal, and working surfaces.

4. Gas Cylinder



This chemical can explode, rocket or harm health if the cylinder is heated, ruptured or leaking.

5. Flame Over Circle



Oxidizing chemicals can react with other materials causing them to burn or explode.

6. Health Hazard



Prolonged exposure to this chemical may cause health problems such as cancer or birth defects. Some chemicals may cause asthma or damage to specific organs of the body.

7. Exclamation Point



This chemical may cause immediate health effects such as rashes or respiratory irritation. Some chemicals may damage the ozone layer.

8. Skull & Cross bones



Exposure to this chemical can cause immediate and possibly serious health problems.

9. Environment (non-mandatory)



This chemical can kill fish and other life that live in the water.

APPENDIX C

APPENDIX D

APPENDIX D

SAFETY DATA SHEET USER'S GUIDE

INTRODUCTION

University employees handle, store and use a variety of chemicals each day. In order to minimize the risk of chemical exposure to employees, it is important to understand how to protect yourself and what to do in the event of an emergency. A Safety Data Sheet (SDS) provides the user with this information.

An explanation of each section is as follows:

SECTION 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 manufacturer, importer, or other responsible party;
- (e) Emergency phone number.

SECTION 2: HAZARD(S) IDENTIFICATION

- (a) Classification of the chemical in accordance with paragraph (d) of the Hazard Communication Standard.
- (b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of the standard. (Hazard symbols may be provided as graphical reproduction in

black and white or the name of 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 $\geq 1\%$ 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.

SECTION 3: COMPOSITION/INFORMATION IN INGREDIENTS

Except as provided for in paragraph (i) of the standard 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 the standard and

- (1) Are present above the 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 (i) of the standard, when there is batch-to-batch variability in the production of the mixture, or for a group of substantially similar mixtures 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 the standard, a statement that the specific chemical identity and/or exact percentage of composition (Concentration) has been withheld as a trade secret is required.

SECTION 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.

SECTION 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).

SECTION 6: ACCIDENTAL RELEASE MEASURES

- (a) Personal precautions, protective equipment, and emergency procedures.
- (b) Methods and materials for containment and cleaning up.

SECTION 7: HANDLING AND STORAGE

- (a) Precautions for safe handling.

SECTION 8: EXPOSURE CONTROL/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.

SECTION 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.

SECTION 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.

SECTION 11: Toxicological Information

Description of the various toxicological (health) effects and the evaluation 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 chemicals 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.

SECTION 12: Ecological Information (non-mandatory)

- (a) Ecotoxicity (aquatic and terrestrial, where available);
- (b) Persistence and degradability;
- (c) Bioaccumulative potential;
- (d) Mobility in soil;

SECTION 13: Disposal Consideration (Non-mandatory)

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.

SECTION 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 need to comply with, in connection with transport or conveyance either within or outside their premises.

SECTION 15: Regulatory Information (Non-mandatory)

Safety, health and environmental regulations specific for the product in question.

SECTION 16: Other Information

The date of preparation of the SDS or the last change to it.

APPENDIX E

APPENDIX E

Glossary

Aerosols – means any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state. Aerosol includes aerosol dispensers.

Alloy – is a metallic material, homogeneous on a macroscopic scale, consisting of two or more elements so combined that they cannot be readily separated by mechanical means. Alloys are considered to be mixtures for the purpose of classification under the GHS.

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

ASTM – means the “American Society of Testing and Materials”

BCF – means “bioconcentration factor”

BOD/COD – means “biochemical oxygen demand/chemical oxygen demand.”

CA – means “competent authority”

Carcinogen – a chemical substance or a mixture of chemical substances which induce cancer or increase its incidence.

CAS – means “Chemical Abstract Service”

CBI - means “confidential business information”

Chemical – used broadly to include substances, products, mixture, preparations, or any other terms that may be used by existing systems.

Chemical Identity – means any name that will uniquely identify a chemical. This can be a name that is in accordance with the nomenclature systems of the International Union of Pure and Applied Chemistry (IUPAC) or the chemical Abstracts Service (CAS) or a technical name.

Competent Authority – means any national body(ies) or authority(ies) designed or otherwise recognized as such in connection with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Compressed Gas – means a gas which when packaged under pressure is entirely gaseous at -50°C

Contact sensitizer – means a substance that will induce an allergic response following skin contact. The definition for “contact sensitizer” is equivalent to “skin sensitizer”.

Criteria – means the technical definition of the physical, health and environmental hazards.

Critical temperature – means the temperature above which a pure gas cannot be liquefied, regardless of the degree of compression.

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

EC₅₀ – means the effective concentration of a substance that causes 50% of the maximum response.

EC Number or (ECN^o) – a reference number used by the European Communities to identify dangerous substances, in particular those registered under EINECS.

ECOSOC – means the “Economic and Social Council of the United Nations”.

EINECS – means “European Inventory of Existing Commercial Chemical Substances”.

End Point – means physical, health and environmental hazards

ErC₅₀ – means EC₅₀ in terms of reduction of growth rate

EU – means “European Union”

Explosive Article – means an article containing one or more explosive substances

Explosive substance – means a solid or liquid substance (or mixture of substances) 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 substances are included even when they do not emit gases.

Eye Irritation – means the production of changes in the eye following the application of test substance to the front surface of the eye, which are fully reversible within 21 days of application.

Flammable aerosol – any gas compressed, liquefied or dissolved under pressure within a non-refillable container made of metal, glass, or plastic, with or without a liquid, paste or powder. The container is fitted with a release device allowing the contents to be ejected as solid

or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid or gaseous state.

Flammable gas – means a gas having a flammable range with air at 20°C and standard pressure of 101.3 kPa.

Flammable liquid – means a liquid having a flash point of not more than 93°C.

Flammable solid – is a solid that is readily combustible, or may cause or contribute to fire through friction. Readily combustible solids are powdered, granular, or pasty substances 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.

Flash Point – means the lowest temperature (corrected to a standard pressure of 101.3 kPa) at which the application of an ignition source causes the vapor of a liquid to ignite under specified test conditions.

Gas – a substance or mixture which at 50° C has a vapor pressure greater than 300kPa; or is completely gaseous at 20° C and a standard pressure of 101.3 kPa.

GESAMP – means “the joint Group of Experts on the Scientific Aspects of marine Environmental Protection of IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP.”

GHS – means the “Globally Harmonized System of Classification and labeling of Chemicals”.

Hazard Category – means the division of criteria within each hazard class, e.g., oral acute toxicity includes five hazard categories and flammable liquid includes 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 – means the nature of the physical, health and environmental hazard, e.g., flammable solid carcinogen, oral acute toxicity.

Hazard Not otherwise Classified (HNOC) – means an adverse 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 classes (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 – means a statement assigned to a hazard class and category that describes the nature of the hazards of a hazardous product, including where appropriate, the degree of hazard.

Hazardous chemical – means any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified (HNOC).

Health Hazard – means a chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard.

IARC – means the “International Agency for Research on Cancer.”

ILO – means the “International Labor Organization”.

IMO – means the “International Maritime Organization”.

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

Initial Boiling Point – means the temperature of a liquid at which its vapor pressure is equal to the standard pressure (101.3kPa), i.e., the first gas bubble appears.

IOMC – means the “Inter-organization Program on the Sound Management of Chemicals”.

IPCS – means the “International Program on Chemical Safety”.

ISO – means International Standards Organization.

IUPAC - means International Union of Pure and Applied Chemistry.

Label – means an appropriate group of written, printed or graphic information elements concerning a hazardous product, selected as relevant to the target sector(s), that is affixed to, printed on, or attached to the immediate container of a hazardous product, or to the outside packaging of a hazardous product.

Label element – means one type of information that has been harmonized for use in a label, e.g., pictogram, signal word.

LC₅₀ (50% lethal concentration) – means the concentration of a chemical in air or of a chemical in water which causes the death of 50% (one-half) of a group of test animals.

LD₅₀ – means the amount of chemical, given all at once, which causes the death of 50% (one-half) of a group of test animals.

L(E)C₅₀ - means LC₅₀ or EC₅₀

Liquefied gas – means a gas which when packaged under pressure, is partially liquid at temperatures above -50°C. A distinction is made between:

- (i) high pressure liquefied gas: a gas with a critical temperature between -50°C and +65°C; and
- (ii) low pressure liquefied gas: a gas with a critical temperature above +65°C.

Liquid – a substance or mixture that is not a gas and which has a melting point or initial melting point of 20° C or less at standard pressure of 101.3 kPa.

MARPOL – means the “International Convention for the Prevention of Pollution from Ships.”

Mixture – solutions composed of two or more substances in which they do not react.

Mutagen – an agent that increase the occurrence of mutations in populations of cells and/or organisms.

Mutation – means a permanent change in the amount or structure of the genetic material in a cell.

NGO – means “non-governmental organization”

NOEC – means the “no observed effect concentration”

OECD – means “The Organization for Economic Cooperation and Development”

Organic peroxide – is an organic liquid or solid which contains the bivalent –O-O- structure and may be considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. This also includes organic peroxide formulations (mixtures).

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

Oxidizing liquid – is a liquid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause or contributes to the combustion of another material.

Oxidizing solid – is a solid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause or contributes to the combustion of another material.

QSAR – means “quantitative structure-activity relationship”

Physical Hazard – means a chemical that is classified as posing one of the following hazardous effects: explosive, flammable, oxidizer, self-reactive, pyrophoric, self-heating, organic peroxide, corrosive to metal, gas under pressure or in contact with water emits flammable gas.

Pictogram – means a graphical composition that may include a symbol plus other graphic elements, such as a border, background pattern or color that is intended to convey specific information.

Precautionary statement – means a phrase (and/or pictogram) that describes recommended measures that should be taken to minimize or

prevent adverse effects resulting from exposure to a hazardous product, or improper storage or handling of a hazardous product.

Product identifier – means a name or number for a hazardous product on a label or in the SDS. It provides a unique means by which the product user can identify the substance or mixture within the particular use setting (e.g. transport, consumer or workplace)

Pyrophoric liquid – is a liquid which, even in small quantities, is liable to ignite within five (5) minutes after coming into contact with air.

Pyrophoric solid – is a solid which, even in small quantities, is liable to ignite within five (5) minutes after coming into contact with air.

Pyrotechnic article – means an article containing one or more pyrotechnic substances.

Pyrotechnic substance – means a substance or mixture of substances 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 (heat-related) chemical reactions.

Readily combustible solid – means powdered, granular, or pasty substance or mixture which is dangerous if it can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly.

Refrigerated liquefied gas – means a gas which when packaged is made partially liquid because of its low temperature.

Respiratory sensitizer – means a substance that induces hypersensitivity of the airways following inhalation of the substance.

Reproductive Toxicity – adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in offspring.

SAR – means “Structure Activity Relationship”

SDS - means “Safety Data Sheet” and in this document is used interchangeably with Material Safety Data Sheet (MSDS).

Self- accelerating Decomposition Temperature (SADT) – means the lowest temperature at which self-accelerating decomposition may occur with substances as packaged.

Self- heating substances – is a solid or liquid, other than a pyrophoric substance, which by reaction with air and without energy supply, is liable to self-heat.

Self-Reactive Substance – a substance that is thermally unstable liquid or solid that is liable to undergo a strongly exothermic thermal decomposition even without the presence of oxygen (air). This excludes materials classified under the GHS as explosive, organic peroxides or as oxidizing.

Signal Word – means a word to indicate the relative severity of hazard and alert the reader to potential hazard on the label. “Danger” is used for more severe hazards, while “warning” is used for less severe.

Skin sensitizer – a substance that will induce an allergic response following skin contact. The definition of “skin sensitizer” is equivalent to “contact sensitizer”.

Solid – a substance or mixture that does not meet the definitions of a liquid or gas.

Substance – chemical element 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.

Technical Name – means a name that is generally used in commerce, regulations and coded to identify a substance or mixture, other than the IUPAC or CAS name, and that is recognized by the scientific community. Examples of technical names include those used for complex mixtures (e.g., petroleum fractions or natural products), pesticides, dyes and minerals.

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

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

APPENDIX F

APPENDIX F

References

1. Fundamentals of Industrial Hygiene, 3rd Edition. National Safety Council.
2. OSHA Hazard Communication Standard (29 CFR1910.1200)
3. HIOSH Hazard Communication Standard (Title 12, Subtitle 8, Chapter 203)
4. Facts on Aligning the Hazard Communication Standard to the GHS (www.osha/as/opa/facts-hcs-ghs.html)
5. Labeling Requirements for OSHA Compliance (www.oshalabel.com/oshs_ghs_labeling.html)
6. A Guide to The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) (www.gov/dsg/hazcom/ghs.html)

EXHIBIT 1A

Date of Inventory: _____

Department: _____

Building and Room #: _____

Completed by: _____

<u>Trade Name</u>	<u>Manufacturer</u>	<u>*Label</u>	<u>**SDS</u>
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Note:

* Indicate – Y (yes) label/ SDS exist; N (no) label/ SDS not exist; or I (inadequate) label/SDS exist

**Indicate date on SDS

EXHIBIT 1B

OUTLINE FOR HAZARD COMMUNICATION TRAINING

- I. Overview of Hazard Communication Training
 - A. HIOSH Hazard Communication Standard (Title 12, Subtitle 8, Chapter 203)
 - B. What is the Purpose?
 - 1. Evaluation of the Hazards
 - 2. Transmit Information
 - C. Who must Comply
 - 1. Manufacturers, Importers, and Distributors of Hazardous Substances
 - 2. Employers: Users of Hazardous Substances
 - D. What is considered a hazardous Substance?
 - 1. Physical or Health Hazards
 - 2. 29 CFR Part 1910, Subpart Z (OSHA)
 - 3. HIOSH (Chapter 202 – Toxic Materials and Harmful Physical Agents)
 - 4. TLV's (ACGIH)
 - E. Carcinogens
 - 1. IARC Monographs (International Agency for Research on Cancer)

2. HIOSH (Chapter 202)

F. Requirements

1. Manufacturers, Importers, Distributors

- a. Evaluate
- b. Label Containers
- c. Provide SDSs

2. Employers

- a. Develop Written Hazard Communication Program
- b. Label Containers
- c. Obtain Safety Data Sheets
- d. Inform/Train Employees

G. Written Hazard Communication Program

1. Labels
2. Safety Data Sheets (SDSs)
3. Employee Information and Training
4. List of Hazardous Substances
5. Non-routine Tasks
6. Unlabeled Pipes
7. Contractor Procedures

II. Labels

A. Manufacturer's Label

1. Identify Hazardous Substances
2. Appropriate Hazard Warning
3. Name and Address of Manufacturer

B. Secondary Containers

1. Identify Hazardous Substances
2. Appropriate Hazard Warning

III. Safety Data Sheets

IV. Employee Information and Training

A. Hazard Communication Requirements

B. Operations Where Hazardous Substances Exist

C. Location and Availability of Written Program

D. Detecting Hazardous Substances Presence or Release

E. Physical/Health Hazards

F. Protective Measures

G. Labeling System

H. Safety Data Sheet

I. Obtaining Hazard Information

EXHIBIT 1C

HAZARD COMMUNICATION TRAINING RECORD

Training Topics:

- Requirements of Hazard Communication Program
- Employee Rights
- Contents of SDS
- Elements of the Written Program
- Physical/Health Effects of Hazardous Substances
- Detection of Hazardous Substances
- How to Prevent Exposure

Instructor: _____

Date: _____

Location: _____

Name (Please Print)	Department	Signature
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

