

## HAZARD COMMUNICATION (HAZCOM)

### **PURPOSE**

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The purpose of this document is to outline the Hazard Communication Program for The Company. It provides detailed safety guidelines and instructions for receipt, use and storage of chemicals at our facility by employees and contractors. Reference: OSHA Standard [29 CFR 1910.1200](#).

### **RESPONSIBILITIES**

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#### **Management**

- Ensure compliance with this program
- Conduct immediate corrective action for deficiencies found in the program
- Maintain an effective Hazard Communication training program
- Make this plan available to employees or their designated representative

#### **Shipping and Receiving Manager**

- Ensure all received containers are properly labeled and that labels are not removed or defaced
- Ensure all shipped containers are properly labeled
- Ensure shipping department employees are properly trained in spill response
- Ensure received Safety Data Sheets (SDS) are properly distributed

#### **Purchasing Agent**

- Obtain, from the manufacturer, SDS for chemicals purchased from retail sources

#### **Safety Department**

- Maintain a list of hazardous chemicals using the identity that is referenced on the SDS
- Monitor the effectiveness of the program
- Conduct annual audit of the program
- Monitor employee training to ensure effectiveness
- Keep management informed of necessary changes
- Ensure SDSs are available as required
- Monitor facility for proper use, storage and labeling of chemicals
- Ensure SDS are available for emergency medical personnel when treating exposed employees
- Provide information, as requested, concerning health effects and exposure symptoms listed on SDS

## Supervisors

- Comply with all specific requirements of the program
- Provide specific chemical safety training for assigned employees
- Ensure chemicals are properly used stored and labeled
- Ensure only the minimum amount necessary is kept at workstations
- Ensure up to date SDS are readily accessible to all employees on all shifts

## Employees

- Comply with chemical safety requirements of this program
- Report any problems with storage or use of chemicals
- Immediately report spills of suspected spills of chemicals
- Use only those chemicals for which they have been trained
- Use chemicals only for specific assigned tasks in the proper manner

## Contractors

- Comply will all aspects of this program
- Coordinate information with the Safety Coordinator
- Ensure Contractor employees are properly trained
- Notify the Safety Coordinator before bringing any chemicals into company property of facilities
- Monitor and ensure proper storage and use of chemicals by Contractor employees

## POLICY

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**This written Hazard Communication Program (HAZCOM)** has been developed based on OSHA Hazard Communication Standard and consists of the following elements:

- Identification of Hazardous Materials
- Product Warning Labels
- Safety Data Sheets (SDS)
- Written Hazard Communication Program
- Effective Employee Training

Some chemicals are explosive, corrosive, flammable, or toxic. Other chemicals are relatively safe to use and store but may become dangerous when they interact with other substances. To avoid injury and/or property damage, persons who handle chemicals in any area of the Company must understand the hazardous properties of the chemicals. Before using a specific chemical, safe handling methods and health hazards must always be reviewed. Supervisors are responsible for ensuring that the equipment needed to work safely with chemicals is accessible and maintained for all employees on all shifts.

A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate Safety Data Sheet shall be maintained and posted in a conspicuous area at each worksite.

SDSs shall be maintained and readily accessible in each work area. SDSs can be maintained at the primary work site. However, they should be available in case of an emergency. SDS must be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director.

An SDS must be obtained for each required chemical. In addition, SDSs are to be maintained in a readily accessible location to employees.

## **EMPLOYEE TRAINING**

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### **Initial Orientation Training**

All new employees shall receive safety orientation training covering the elements of the HAZCOM and Right to Know Program. This training will consist of general training covering:

- Location and availability of the written Hazard Communication Program
- Location and availability of the List of Chemicals used in the workplace
- Methods and observation used to detect the presence or release of a hazardous chemical in the workplace.
- The specific physical and health hazard of all chemicals in the workplace
- Specific control measures for protection from physical or health hazards
- Explanation of the chemical labeling system
- Location and use of SDS

Employees shall be provided with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and safety data sheets.

### **Job Specific Training**

Employees will receive on the job training from their supervisor. This training will cover the proper use, inspection and storage of necessary personal protective equipment and chemical safety training for the specific chemicals they will be using or will be working around.

### **Annual Refresher Training**

Annual Hazard Communication refresher training will be conducted as part of The Company's continuing safety training program.

### **Immediate On-the-Spot Training**

This training will be conducted by supervisors for any employee that requests additional information or exhibits a lack of understanding of the safety requirements.

## **NON-ROUTINE TASKS**

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Non-routine tasks are defined as working on, near, or with unlabeled piping, unlabeled containers of an unknown substance, confined space entry where a hazardous substance may be present and/or a one-time task using a hazardous substance differently than intended (example: using a solvent to remove stains from tile floors).

### **Steps for Non-Routine Tasks:**

- Step 1: Hazard Determination
- Step 2: Determine Precautions
- Step 3: Specific Training and Documentation
- Step 4: Perform Task

All non-routine tasks will be evaluated by the Department Supervisor and Safety Department before the task commences, to determine all hazards present. This determination will be conducted with quantitative/qualitative analysis (air sampling, substance identification/analysis, etc., as applicable).

Once the hazard determination is made, the Department Supervisor and Safety Department will determine the necessary precautions needed to either remove the hazard, change to a non-hazard, or protect from the hazard (use of personal protective equipment) to safeguard the Employees present. In addition, the Department Supervisor or Safety Department will provide specific safety training for Employees present or affected and will document the training using the Chemical Safety Training Checklist form which shall be marked "**Non-Routine Task Training.**"

## **OFF SITE USE OR TRANSPORTATION OF CHEMICALS**

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An SDS will be provided to employees for each chemical and each occurrence of use or transport away from The Company facilities. All State and Federal DOT Regulations will be followed including use of certified containers, labeling and marking, securing of containers and employee training.

## **GENERAL CHEMICAL SAFETY**

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**Assume all chemicals are hazardous.** The number of hazardous chemicals and the number of reactions between them is so large that prior knowledge of all potential hazards cannot be assumed. Use chemicals in as small quantities as possible to minimize exposure and reduce possible harmful effects.

### **The following general safety rules shall be observed when working with chemicals:**

- Read and understand the Safety Data Sheets.
- Keep the work area clean and orderly.
- Use the necessary safety equipment.

- Carefully label every container with the identity of its contents and appropriate hazard warnings.
- Store incompatible chemicals in separate areas.
- Substitute less toxic materials whenever possible.
- Limit the volume of volatile or flammable material to the minimum needed for short operation periods.
- Provide means of containing the material if equipment or containers should break or spill their contents.

## **TASK EVALUTATION**

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Each task that requires the use of chemicals should be evaluated to determine the potential hazards associated with the work. This hazard evaluation must include the chemical or combination of chemicals that will be used in the work, as well as other materials that will be used near the work. If a malfunction during the operation has the potential to cause serious injury or property damage, a Safe Operational Procedure (SOP) should be prepared and followed. Operations must be planned to minimize the generation of hazardous wastes.

## **CHEMICAL STORAGE**

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The separation of chemicals (solids or liquids) during storage is necessary to reduce the possibility of unwanted chemical reactions caused by accidental mixing. Explosives should be stored separately outdoors. Use either distance or barriers (e.g., trays) to isolate chemicals into the following groups:

- Flammable Liquids: store in approved flammable storage lockers.
- Acids: treat as flammable liquids
- Bases: do not store bases with acids or any other material
- Other liquids: ensure other liquids are not incompatible with any other chemical in the same storage location.
- Lips, strips, or bars are to be installed across the width of storage shelves to restrain the chemicals in case of earthquake.

Chemicals will not be stored in the same refrigerator used for food storage. Refrigerators used for storing chemicals must be appropriately identified by a label on the door.

## **CONTAINER LABELS**

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It is extremely important that all containers of chemicals are properly labeled. This includes every type of container from a 5000-gallon storage tank to a spray bottle of degreaser. The following requirements apply:

- All containers will have the appropriate label, tag or marking prominently displayed that indicates the identity, safety and health hazards.

- Portable containers which contain a small amount of chemical need not be labeled if they are used immediately that shift but must be under the strict control of the employee using the product.
- All warning labels, tags, etc., must be maintained in a legible condition and not be defaced. Facility weekly supervisor inspections will check for compliance of this rule.
- Incoming chemicals are to be checked for proper labeling.

Each container label should contain the following information:

- Pictograms
- Precautionary statements
- Name, address and telephone number of the chemical manufacture

## **EMERGENCIES AND SPILLS**

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In case of an emergency, implement the proper Emergency Action Plan

- Evacuate people from the area.
- Isolate the area.
- If the material is flammable, turn off ignition and heat sources.
- Only personnel specifically trained in emergency response are permitted to participate in chemical emergency procedures beyond those required to evacuate the area.
- Call for Emergency Response Team assistance if required.

## **HOUSEKEEPING**

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- Maintain the smallest possible inventory of chemicals to meet immediate needs.
- Periodically review stock of chemicals on hand.
- Ensure that storage areas, or equipment containing large quantities of chemicals, are secure from accidental spills.
- Rinse emptied bottles that contain acids or inflammable solvents before disposal.
- Recycle unused laboratory chemicals wherever possible.
- **DO NOT** Place hazardous chemicals in salvage or garbage receptacles.
- **DO NOT** Pour chemicals onto the ground.
- **DO NOT** Dispose of chemicals through the storm drain system.
- **DO NOT** Dispose of highly toxic, malodorous chemicals down sinks or sewer drains.

## **MULTI-EMPLOYERS WORKSITE**

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Where employees must travel between workplaces throughout the course of business, the written HAZCOM Program will be available in the employee "pocket sized safety manual" that shall be kept in each work vehicle at all times.



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All outside contractors working inside Company Facilities are required to follow the requirements of this program. The Company will provide Contractors information concerning:

- Pre-job/ kick-off briefing shall be conducted with the contractor prior to the initiation of work on the site.
- Location of SDS
- Precautions to be taken to protect contractor employees
- Potential exposure to hazardous substances
- Chemicals used in or stored in areas where they will be working
- Location and availability of Safety Data Sheets
- Recommended Personal Protective Equipment
- Labeling system for chemicals

A written hazard communication program shall be developed, implemented, and maintained at each workplace that describes how labels and other forms of warning, safety data sheets, and employee information will be met.

### **SDS INFORMATION**

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**Safety Data Sheets** are provided by the chemical manufacturer to provide additional information concerning safe use of the product. Each SDS provides:

- Common Name and Chemical Name of the material
- Name, address and phone number of the manufacturer
- Emergency phone numbers for immediate hazard information
- Date the SDS was last updated
- Listing of hazardous ingredients
- Chemical hazards of the material
- Information for identification of chemical and physical properties

### **INFORMATION CHEMICAL USERS MUST KNOW**

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#### **Fire and/or Explosion Information**

- Material Flash Point, auto-ignition temperature and upper/lower flammability limits
- Proper fire extinguishing agents to be used
- Firefighting techniques
- Any unusual fire or explosive hazards

#### **Chemical Reaction Information**

- Stability of Chemical
- Conditions and other materials which can cause reactions with the chemical
- Dangerous substances that can be produced when the chemical reacts

### **Control Measures**

- Engineering Controls required for safe product use
- Personal protective equipment required for use of product
- Safe storage requirements and guidelines
- Safe handling procedures

### **Health Hazards**

- Permissible Exposure Limit (PEL) and Threshold Limit Value (TLV)
- Acute or Chronic symptoms of exposure
- Main routes of entry into the body
- Medical conditions that can be made worse by exposure
- Cancer causing properties if any
- Emergency and First Aid treatments

### **Spill and Leak Procedures**

- Clean up techniques
- Personal Protective Equipment to be used during cleanup
- Disposal of waste and cleanup material

### **EMPLOYEE USE OF SDS**

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#### **For SDS use to be effective, employees must:**

- Know the location of the SDS
- Understand the major points for each chemical
- Check SDS when more information is needed, or questions arise
- Be able to quickly locate the emergency information on the SDS
- Follow the safety practices provided on the SDS

### **DEFINITIONS**

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

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

**Compressed gas** - any compound that exhibits:

- i. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 deg. F.
- ii. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F. regardless of the pressure at 70 deg. F.
- iii. A liquid having a vapor pressure exceeding 40 psi at 100 deg. F.

**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.

**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.

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

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

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

- i. "Aerosol, flammable" means an aerosol that yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;
- ii. "Gas, flammable" means:
  - a. A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or,
  - b. A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;
- iii. "Liquid, flammable" means any liquid having a flash point below 100 deg. F., except any mixture having components with flash points of 100 deg. F. or higher, the total of which make up 99 percent or more of the total volume of the mixture.
- iv. "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in [29 CFR 1910.109\(a\)](#), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

**Flash point** - the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite.

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

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

**Health hazard** - a chemical for which there is evidence 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.

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

**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.

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

**Safety data sheet (SDS)** - written or printed material concerning a hazardous chemical which is prepared in accordance with OSHA Standard [29 CFR 1910.1200](#) requirements.

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

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

**Physical hazard** - a chemical that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

**Pyrophoric** - a chemical that will ignite spontaneously in air at a temperature of 130 deg. F. or below.



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**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.

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

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

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

**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.

## **GHS (GLOBAL HARMONIZATION SYSTEM)**

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## **INTRODUCTION**

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The Globally Harmonized System (GHS) is an international approach to hazard communication, providing agreed criteria for classification of chemical hazards, and a standardized approach to label elements and safety data sheets. The GHS was negotiated in a multi-year process by hazard communication experts from many different countries, international organizations, and stakeholder groups. It is based on major existing systems around the world, including OSHA's Hazard Communication Standard and the chemical classification and labeling systems of other US agencies.

The result of this negotiation process is the United Nations' document entitled "Globally Harmonized System of Classification and Labeling of Chemicals," commonly referred to as The Purple Book. This document provides harmonized classification criteria for health, physical, and environmental hazards of chemicals. It also includes standardized label elements that are assigned to these hazard classes and categories, and provide the appropriate signal words, pictograms, and hazard and precautionary statements to convey the hazards to users. A standardized order of information for safety data sheets is also provided. These recommendations can be used by regulatory authorities such as OSHA to establish mandatory requirements for hazard communication, but do not constitute a model regulation.

## **OVERVIEW**

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The revised Hazard Communication Standard (HCS) is a modification to the existing standard. The parts of the standard that did not relate to the GHS (such as the basic framework, scope, and exemptions) remained largely unchanged. There have been some modifications to terminology in order to align the revised HCS with language used in the GHS. For example, the term "hazard determination" has been changed to "hazard classification" and "material safety data sheet" was changed to "safety data sheet." OSHA stakeholders commented on this approach and found it to be appropriate.

Under both the current Hazard Communication Standard (HCS) and the revised HCS, an evaluation of chemical hazards must be performed considering the available scientific evidence concerning such hazards. Under the current HCS, the hazard determination provisions have definitions of hazard and the evaluator determines whether or not the data on a chemical meet those definitions. It is a performance-oriented approach that provides parameters for the evaluation, but not specific, detailed criteria. The hazard classification approach in the revised HCS is quite different. The revised HCS has specific criteria for each health and physical hazard, along with detailed instructions for hazard evaluation and determinations as to whether mixtures or substances are covered. It also establishes both hazard classes and hazard categories—for most of the effects; the classes are divided into categories that reflect the relative severity of the effect. The current HCS does not include categories for most of the health hazards covered, so this new approach provides additional information that can be related to the appropriate response to address the hazard. OSHA has included the general provisions for hazard classification in paragraph (d) of the revised rule and added extensive appendixes (Appendixes A and B) that address the criteria for each health or physical effect.

### **Major changes to the Hazard Communication Standard?**

A. The three major areas of change are in hazard classification, labels, and safety data sheets.

**Hazard classification:** The definitions of hazard have been changed to provide specific criteria for classification of health and physical hazards, as well as classification of mixtures. These specific criteria will help to ensure that evaluations of hazardous effects are consistent across manufacturers, and that labels and safety data sheets are more accurate as a result.

**Labels:** Chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided.

**Safety Data Sheets:** Will now have a specified 16-section format.

## **HAZARD COMMUNICATION STANDARD: SAFETY DATA SHEETS**

The information required on the safety data sheet (SDS) will remain essentially the same as that in the current standard (HazCom 1994). HazCom 1994 indicates what information has to be included on an SDS but does not specify a format for presentation or order of information. The revised Hazard Communication Standard (HazCom 2012) requires that the information on the SDS be presented using specific headings in a specified sequence.

Paragraph (g) of the final rule provides the headings of information to be included on the SDS and the order in which they are to be provided. In addition, Appendix D provides the information to be included under each heading. The SDS format is the same as the ANSI standard format, which is widely used in the U.S. and is already familiar to many employees.

### **The format of the 16-section SDS should include the following sections:**

- Section 1. Identification
- Section 2. Hazard(s) identification
- Section 3. Composition/information on ingredients
- Section 4. First-Aid measures
- Section 5. Fire-fighting measures
- Section 6. Accidental release measures
- Section 7. Handling and storage
- Section 8. Exposure controls/personal protection
- Section 9. Physical and chemical properties
- Section 10. Stability and reactivity
- Section 11. Toxicological information
- Section 12. Ecological information
- Section 13. Disposal considerations
- Section 14. Transport information
- Section 15. Regulatory information
- Section 16. Other information, including date of preparation or last revision

The SDS must also contain Sections 12-15, to be consistent with the United Nations' Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Although the headings for Sections 12-15 are mandatory, OSHA will not enforce the content of these four sections because these sections are within other agencies' jurisdictions.

The Hazard Communication Standard (HCS) ([29 CFR 1910.1200\(g\)](#)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards. The information contained in the SDS is largely the same as the former MSDS, except now the SDSs are required to be presented in a consistent user-friendly, 16-section format. This brief provides guidance to help workers who



handle hazardous chemicals to become familiar with the format and understand the contents of the SDSs.

The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages as well). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in [Appendix D of 29 CFR 1910.1200](#). The SDS preparers may also include additional information in various section(s).

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies

A description of all 16 sections of the SDS, along with their contents, is presented here:

### Section 1: Identification

This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier. The required information consists of:

Product identifier used on the label and any other common names or synonyms by which the substance is known.

Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.

Recommended use of the chemical (e.g., a brief description of what it actually does, such as flame retardant) and any restrictions on use (including recommendations given by the supplier).<sup>1</sup>

### Section 2: Hazard(s) Identification



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This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards. The required information consists of:

The hazard classification of the chemical (e.g., flammable liquid, category<sup>1</sup>).

Signal word.

Hazard statement(s).

Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g., skull and crossbones, flame).

Precautionary statement(s).

Description of any hazards not otherwise classified.

For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing how much (percentage) of the mixture consists of ingredient(s) with unknown acute toxicity. Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s).

## Section 3: Composition/Information on Ingredients

This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed. The required information consists of:

### Substances

Chemical name.

Common name and synonyms.

Chemical Abstracts Service (CAS) number and other unique identifiers.

Impurities and stabilizing additives, which are themselves classified and which contribute to the classification of the chemical.

### Mixtures

Same information required for substances.

The chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards and are:

Present above their cut-off/concentration limits or

Present a health risk below the cut-off/concentration limits.

The concentration (exact percentages) of each ingredient must be specified except concentration ranges may be used in the following situations:

A trade secret claim is made,

There is batch-to-batch variation, or

The SDS is used for a group of substantially similar mixtures.

Chemicals where a trade secret is claimed



A statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

#### Section 4: First-Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical. The required information consists of:

Necessary first-aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).  
Description of the most important symptoms or effects, and any symptoms that are acute or delayed.  
Recommendations for immediate medical care and special treatment needed, when necessary.

#### Section 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical. The required information consists of:

Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.  
Advice on specific hazards that develop from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.  
Recommendations on special protective equipment or precautions for firefighters.

#### Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard. The required information may consist of recommendations for:

Use of personal precautions (such as removal of ignition sources or providing sufficient ventilation) and protective equipment to prevent the contamination of skin, eyes, and clothing.  
Emergency procedures, including instructions for evacuations, consulting experts when needed, and appropriate protective clothing.  
Methods and materials used for containment (e.g., covering the drains and capping procedures).  
Cleanup procedures (e.g., appropriate techniques for neutralization, decontamination, cleaning or vacuuming; adsorbent materials; and/or equipment required for containment/clean up)



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## Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of chemicals. The required information consists of:

Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., eating, drinking, and smoking in work areas is prohibited).

Recommendations on the conditions for safe storage, including any incompatibilities. Provide advice on specific storage requirements (e.g., ventilation requirements)

## Section 8: Exposure Controls/Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure. The required information consists of:

OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.

Appropriate engineering controls (e.g., use local exhaust ventilation, or use only in an enclosed system).

Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals, such as personal protective equipment (PPE) (e.g., appropriate types of eye, face, skin or respiratory protection needed based on hazards and potential exposure).

Any special requirements for PPE, protective clothing or respirators (e.g., type of glove material, such as PVC or nitrile rubber gloves; and breakthrough time of the glove material).

## Section 9: Physical and Chemical Properties

This section identifies physical and chemical properties associated with the substance or mixture. The minimum required information consists of:

Appearance (physical state, color, etc.);

Upper/lower flammability or explosive limits;

Odor;

Vapor pressure;

Odor threshold;

Vapor density;

pH;

Relative density;

Melting point/freezing point;

Solubility(ies);



Initial boiling point and boiling range;  
Flash point;  
Evaporation rate;  
Flammability (solid, gas);  
Upper/lower flammability or explosive limits;  
Vapor pressure;  
Vapor density;  
Relative density;  
Solubility(ies);  
Partition coefficient: n-octanol/water;  
Auto-ignition temperature;  
Decomposition temperature; and  
Viscosity.

The SDS may not contain every item on the above list because information may not be relevant or is not available. When this occurs, a notation to that effect must be made for that chemical property. Manufacturers may also add other relevant properties, such as the dust deflagration index (Kst) for combustible dust, used to evaluate a dust's explosive potential

#### Section 10: Stability and Reactivity

This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other. The required information consists of:

##### Reactivity

Description of the specific test data for the chemical(s). This data can be for a class or family of the chemical if such data adequately represent the anticipated hazard of the chemical(s), where available.

##### Chemical stability

Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled.

Description of any stabilizers that may be needed to maintain chemical stability.

Indication of any safety issues that may arise should the product change in physical appearance.

##### Other

Indication of the possibility of hazardous reactions, including a statement whether the chemical will react or polymerize, which could release excess pressure or heat, or create other hazardous conditions. Also, a description of the conditions under which hazardous reactions may occur.

List of all conditions that should be avoided (e.g., static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions).

List of all classes of incompatible materials (e.g., classes of chemicals or specific substances) with which the chemical could react to produce a hazardous situation.



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List of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating. (Hazardous combustion products should also be included in Section 5 (Fire-Fighting Measures) of the SDS.)

## Section 11: Toxicological Information

This section identifies toxicological and health effects information or indicates that such data are not available. The required information consists of:

Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is unknown.

Description of the delayed, immediate, or chronic effects from short- and long-term exposure.

The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 (median lethal dose)) - the estimated amount [of a substance] expected to kill 50% of test animals in a single dose.

Description of the symptoms. This description includes the symptoms associated with exposure to the chemical including symptoms from the lowest to the most severe exposure.

Indication of whether the 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 editions) or found to be a potential carcinogen by OSHA

## Section 12: Ecological Information (non-mandatory)

This section provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment. The information may include:

Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available (e.g., acute or chronic aquatic toxicity data for fish, algae, crustaceans, and other plants; toxicity data on birds, bees, plants).

Whether there is a potential for the chemical to persist and degrade in the environment either through biodegradation or other processes, such as oxidation or hydrolysis.

Results of tests of bioaccumulation potential, making reference to the octanol-water partition coefficient (Kow) and the bioconcentration factor (BCF), where available.

The potential for a substance to move from the soil to the groundwater (indicate results from adsorption studies or leaching studies).

Other adverse effects (e.g., environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and/or global warming potential).

## Section 13: Disposal Considerations (non-mandatory)



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This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS. The information may include:

- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities

## Section 14: Transport Information (non-mandatory)

This section provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea. The information may include:

- UN number (i.e., four-figure identification number of the substance)<sup>1</sup>.
- UN proper shipping name<sup>1</sup>.
- Transport hazard class(es)<sup>1</sup>.
- Packing group number, if applicable, based on the degree of hazard<sup>2</sup>.
- Environmental hazards (e.g., identify if it is a marine pollutant according to the International Maritime Dangerous Goods Code (IMDG Code)).
- Guidance on transport in bulk (according to Annex II of MARPOL 73/78<sup>3</sup> and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code (IBC Code))).
- Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises (indicate when information is not available).

## Section 15: Regulatory Information (non-mandatory)

This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS. The information may include:










- Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations)

## Section 16: Other Information

This section indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes. Other useful information also may be included here.




## NEW HCS PICTOGRAMS AND HAZARDS

There are nine pictograms under the GHS to convey the health, physical and environmental hazards. The final Hazard Communication Standard (HCS) requires eight of these pictograms, the exception being the environmental pictogram, as environmental hazards are not within OSHA's jurisdiction. The hazard pictograms and their corresponding hazards are shown below.

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

**ALLOCATION OF LABEL ELEMENTS (EXAMPLES)**

In the revised Hazard Communication Standard (HCS), OSHA has provided classifiers with the option of relying on the classification listings of IARC and NTP to make classification decisions regarding carcinogenicity, rather than applying the criteria themselves. OSHA believes that this will make classification easier for classifiers, as well as lead to greater consistency. In addition, OSHA has provided in non-mandatory Appendix F of the revised rule, guidance on hazard classification for carcinogenicity. Part A of Appendix F includes background guidance provided by GHS based on the Preamble of the IARC "Monographs on the Evaluation of Carcinogenic Risks to Humans" (2006). Part B provides IARC classification information. Part C provides background guidance from the National NTP "Report on Carcinogens" (RoC), and Part D is a table that compares GHS carcinogen hazard categories to carcinogen classifications under IARC and NTP, allowing classifiers to be able to use information from IARC and NTP RoC carcinogen classifications to complete their classifications under the GHS, and thus the HCS.

<b>CARCINOGENICITY</b>		
<b>Category 1A</b>	<b>Category 1B</b>	<b>Category 2</b>
<b>Danger</b>	<b>Danger</b>	<b>Warning</b>
		
<b>May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</b>	<b>May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</b>	<b>Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</b>
<b>Not required under the UN Recommendations on the Transport of Dangerous Goods, Model Regulations.</b>		

OSHA is retaining the requirement to include the American Conference of Government Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) on the safety data sheet (SDS) in the revised Standard. OSHA finds that requiring TLVs on the SDS will provide employers and employees with useful information to help them assess the hazards presented by their workplaces. In addition to TLVs, OSHA permissible exposure limits (PELs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet are also required.

**The Company strictly adheres to these guidelines.**