

# A Snapshot in Safety and Risk

## Chemical Safety in the Workplace

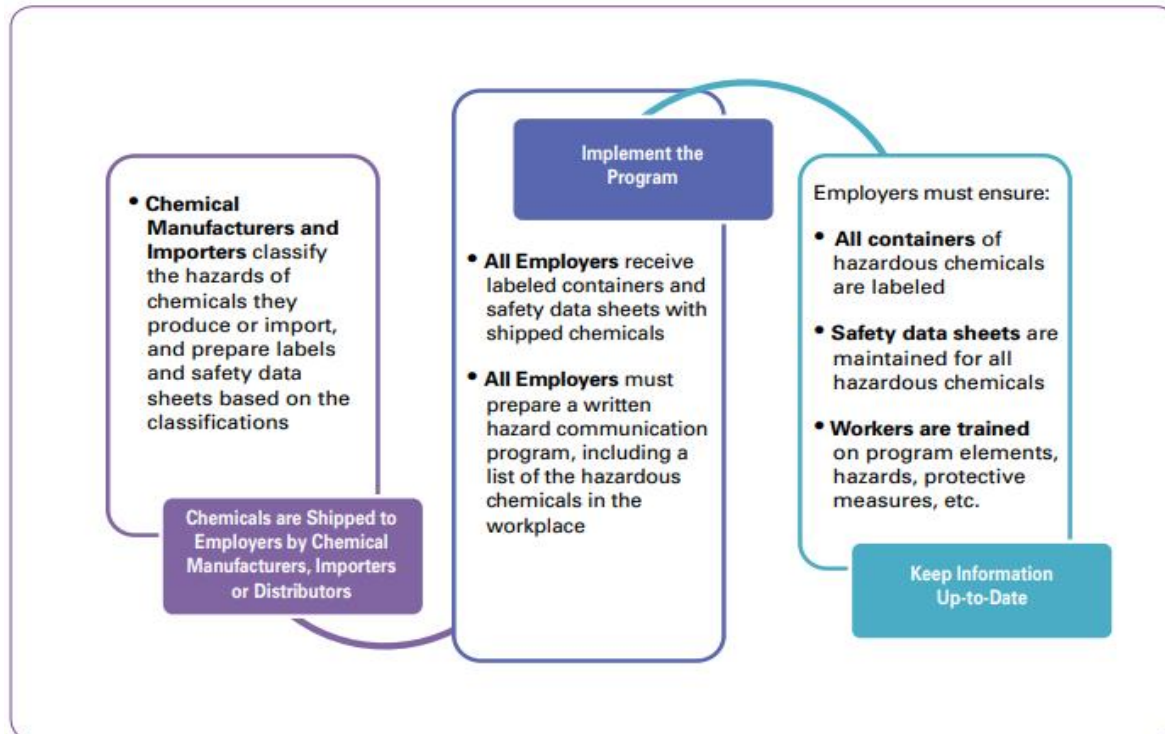
### Introduction

From cleaning agents to pesticides to paints, chemicals have become a part of almost every aspect of modern life. Today, chemicals include various applications and are produced and used in nearly all workplaces. *According to the Occupational Safety and Health Administration (OSHA), there are more than 190,000 illnesses and 50,000 deaths that occur annually as a result of chemical exposures.*

The effects include health hazards (such as inhalations and exposures) and physical hazards (such as burns and explosions). To protect employees and reduce the potential for illness or injury, employers need to have a plan to manage chemical inventories, employee communication, storage, and employee protection. Your workers have a right to know and understand the information about the chemicals in your work areas as well as how to protect themselves.

OSHA has established regulatory standards to address workplace requirements called Hazard Communication. Below is a summary of the OSHA Hazard Communication process flow:

\*Source: OSHA Hazard Communication Guide for Employers



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## What Should Be Included in your Chemical Safety Plan?

Having a written chemical safety is the foundation for ensuring chemical safety within your operation. Defining roles and responsibilities as well as process flow for managing hazardous chemicals is necessary to ensure the safety of your employees and guests.

The chemical safety plan should include:

1. Roles & Responsibilities
2. Chemical Inventory
3. Chemical Labeling and Safety Data Sheets (SDS)
4. Chemical Storage
5. Employee Training & Communication

## Chemical Inventory

It's critical to have awareness of hazardous chemicals present in your work areas or work site. An accurate chemical inventory allows hazards associated with chemicals to be identified and communicated to potential users. Additionally, the inventory also serves as a reference point to ensure comprehensive access to safety data sheets (SDS).

Having an accurate chemical inventory is also necessary to meet compliance requirements for OSHA, local agencies (such as county/state EPA), and first responders. Ensuring an accurate chemical inventory means a well-defined process is in place for the acquisition of chemicals and a process by which chemicals outside the organization are reviewed and approved to come into the workplace. To accomplish this, a defined flow chart and/or chemical management process may be utilized.

## Chemical Labeling & Safety Data Sheets (SDS)

All hazardous chemicals entering the workplace must have required labeling and Safety Data Sheets (SDS) if shipped from a manufacturer or distributor. Since chemicals are manufactured and distributed across the world, in 2003 the United Nations required a change to ensure consistency with labeling and safety data sheets (formerly material safety data sheets).

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The United Nations established the use of the Globally Harmonized System (GHS) for Classification and Labelling of Chemicals. The GHS includes criteria for the classification of health, physical, and environmental hazards as well as specifying what information should be included on labels of hazardous chemicals as well as SDSs. A key component of the new requirements was the use of Pictograms and use of standardized SDS content.

Pictograms are one of the key elements for labeling containers and are a method of describing the hazard using symbols rather than language. Nine pictograms are used in chemical labeling. To the right are the pictogram symbols and information about each:

In addition to hazard pictograms, the following must be communicated on the label:

- an identification of the product;
- a signal word – either **Danger** or **Warning** – where necessary
- [hazard statements](#), indicating the nature and degree of the risks posed by the product
- [precautionary statements](#), indicating how the product should be handled to minimize risks to the user (as well as to other people and the general environment)
- the identity of the supplier (manufacture or importer)

<p><b>Health Hazard</b></p> <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>	<p><b>Flame</b></p> <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> <li>• Desensitized Explosives</li> </ul>	<p><b>Exclamation Mark</b></p> <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>• Hazard Not Otherwise Classified (non-mandatory)</li> <li>• Hazardous to Ozone Layer (non-mandatory)</li> </ul>
<p><b>Gas Cylinder</b></p> <ul style="list-style-type: none"> <li>• Gases Under Pressure</li> <li>• Chemicals Under Pressure</li> </ul>	<p><b>Corrosion</b></p> <ul style="list-style-type: none"> <li>• Skin Corrosion/Burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>	<p><b>Exploding Bomb</b></p> <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
<p><b>Flame Over Circle</b></p> <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<p><b>Environment (non-mandatory)</b></p> <ul style="list-style-type: none"> <li>• Aquatic Toxicity</li> </ul>	<p><b>Skull and Crossbones</b></p> <ul style="list-style-type: none"> <li>• Acute Toxicity (fatal or toxic)</li> </ul>

## Compatibility & Storage

Chemical compatibility is used to determine how two chemicals will interact when they come into contact. Based on how the chemicals will interact, they are either compatible or incompatible. When chemicals are incompatible, they react with one another in a manner that can cause corrosion, mechanical weakening, evolution of gas, fire, explosions, or other undesirable results.

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Chemical compatibility is important when choosing how to store chemicals so that:

- The storage container (a cabinet, for example) is not damaged by the chemical contents.
- Any container leakage does not create a dangerous chemical interaction with chemical contents. For example, storing bleach and ammonia together can cause the production of poisonous fumes if leaks were to mix.

## How the Safety Data Sheet (SDS) Can Help:

- Always review the SDS for each chemical to determine appropriate storage practices.
- Section 7 (Handling & Storage) & Section 10 (Stability & Reactivity) on SDS should be reviewed.

## Employee Communication & Training

Having hazardous chemicals present in your workplace means that employers must let employees know about what is present and their health effects, the hazards of the chemicals, and how to adequately protect themselves. As such, employees must be trained adequately to prevent injuries and to comply with regulations. Training must take place at the time of their initial assignment and prior to use of or exposure to any hazardous chemicals (including those from other employers). When a new or revised SDS is received, employees must be trained within 30 days. What should be included in employee training:

- An overview of the requirements contained in the Hazard Communication Standard.
- Hazardous chemicals present at employee workplaces.
- Physical and health risks of the hazardous chemicals present or exposed.
- Symptoms of overexposure.
- How to determine the presence or release of hazardous chemicals in his or her work area.
- How to reduce or prevent exposure to hazardous chemicals through the use of control procedures, work practices, and personal protective equipment.
- Steps the company has taken to reduce or prevent exposure to hazardous chemicals.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- How to read labels and review SDSs to obtain hazard information.
- Location of the SDS file and written hazard communication program.
- An overview of the requirements contained in the Hazard Communication Standard.
- Employees' rights to personally receive information about hazardous chemicals to which they may be exposed. This includes their physician or collective bargaining agent to receive information.

All training materials must be appropriate in both content and vocabulary for the education level, literacy level, and language comprehension level of employees. Employees must be provided the opportunity to ask questions of the person conducting the training.

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For multi-employer workplaces, it's the responsibility of your company to provide employers of any other employees at the work site with information on the hazardous chemicals present, labeling, and SDSs. It's also the responsibility of your organization to identify and obtain SDSs for the chemicals the contractor is bringing into the workplace.

**Resources:**

OSHA Hazard Communication Summary: <https://www.osha.gov/hazcom>

National Institute for Occupational Safety & Health (NIOSH) – chemical hazard pocket guide: <https://www.cdc.gov/niosh/npg/default.html>

OSHA GHS Background: [https://www.osha.gov/hazcom/global#:~:text=Background,Labeling%20of%20Chemicals%20\(GHS\).](https://www.osha.gov/hazcom/global#:~:text=Background,Labeling%20of%20Chemicals%20(GHS).)