

SQ: Hazard Communication



Welcome to **SQ: Hazard Communication**.

Select START MODULE to begin.

Be sure to click on all of the interactive elements in the module in order to advance.

Introduction

Chemical Hazards

Physical Hazards

Health Hazards

OSHA Hazard Communication Standard

Labels and Pictograms

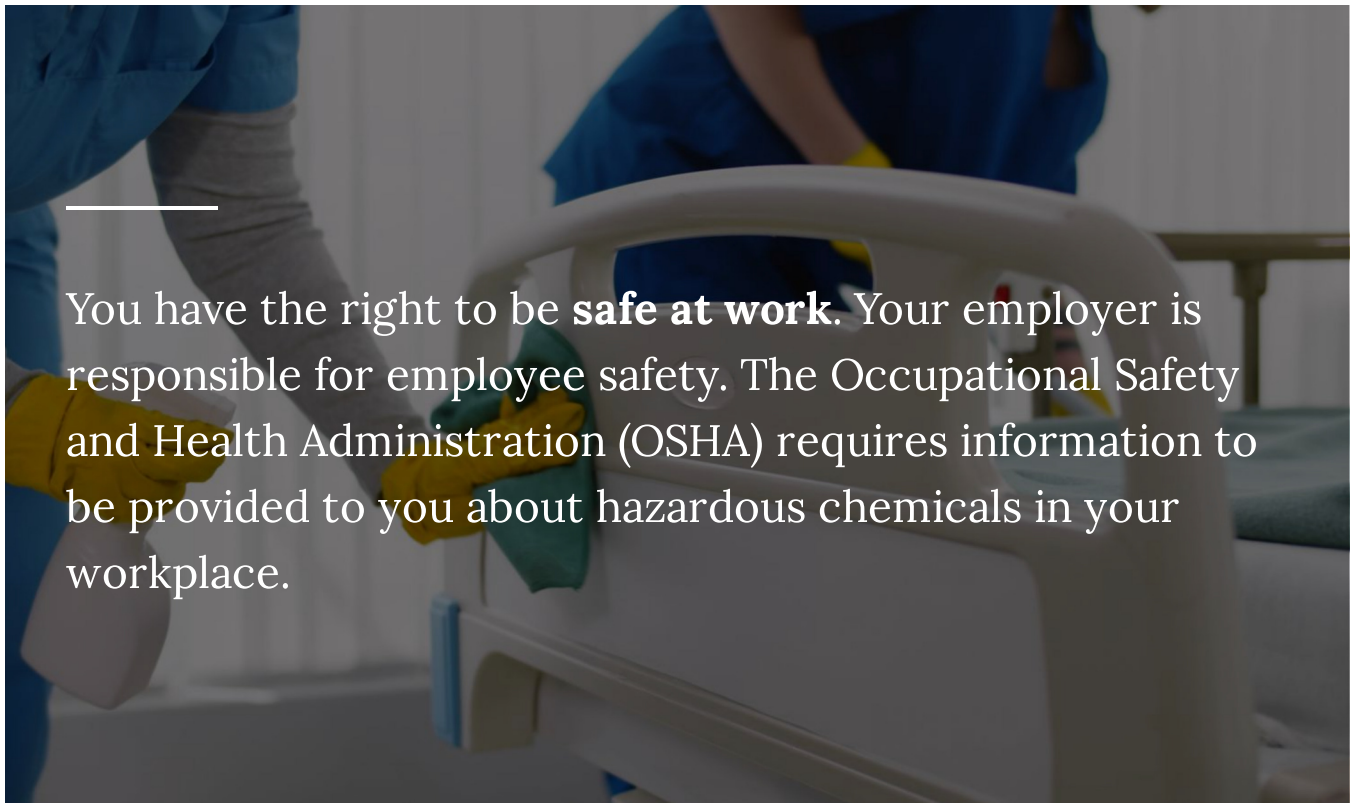
Safety Data Sheets

Personal Protective Equipment

Common Hazardous Chemicals

Module Conclusion

Introduction



You have the right to be **safe at work**. Your employer is responsible for employee safety. The Occupational Safety and Health Administration (OSHA) requires information to be provided to you about hazardous chemicals in your workplace.

This module covers:

- 1 **Types** of chemical hazards
- 2 How to **protect yourself**
- 3 Information about hazardous chemicals that you need to know to **keep you safe**

Please look at the important terms before you begin.

Select "+" to expand.

Glossary —

Anesthetic gases

Medicated air that provides an altered level of consciousness

Acute toxicity

The toxic effect resulting from a single dose or short exposure to a substance

Carcinogen

Something that can cause cancer

Combustible

Able to start a fire

Contaminated

Soiled

Corrosive

Having the power to weaken or destroy gradually

Disinfect

Process to clean equipment and supplies

Health hazard

A chemical that is classified as causing hazardous effects such as skin corrosion, eye irritation or damage, respiratory or skin sensitization, organ toxicity, etc.

Oxidizer

Chemical with a significant fire hazard

Physical hazard

A chemical that is classified as causing hazardous effects, such as those that are explosive, flammable, self-reactive, self-heating, corrosive to metal, etc.

Sterilize

Remove all bacterial and viral spores from instruments

Toxic

Poisonous; able to cause serious debilitation or even death

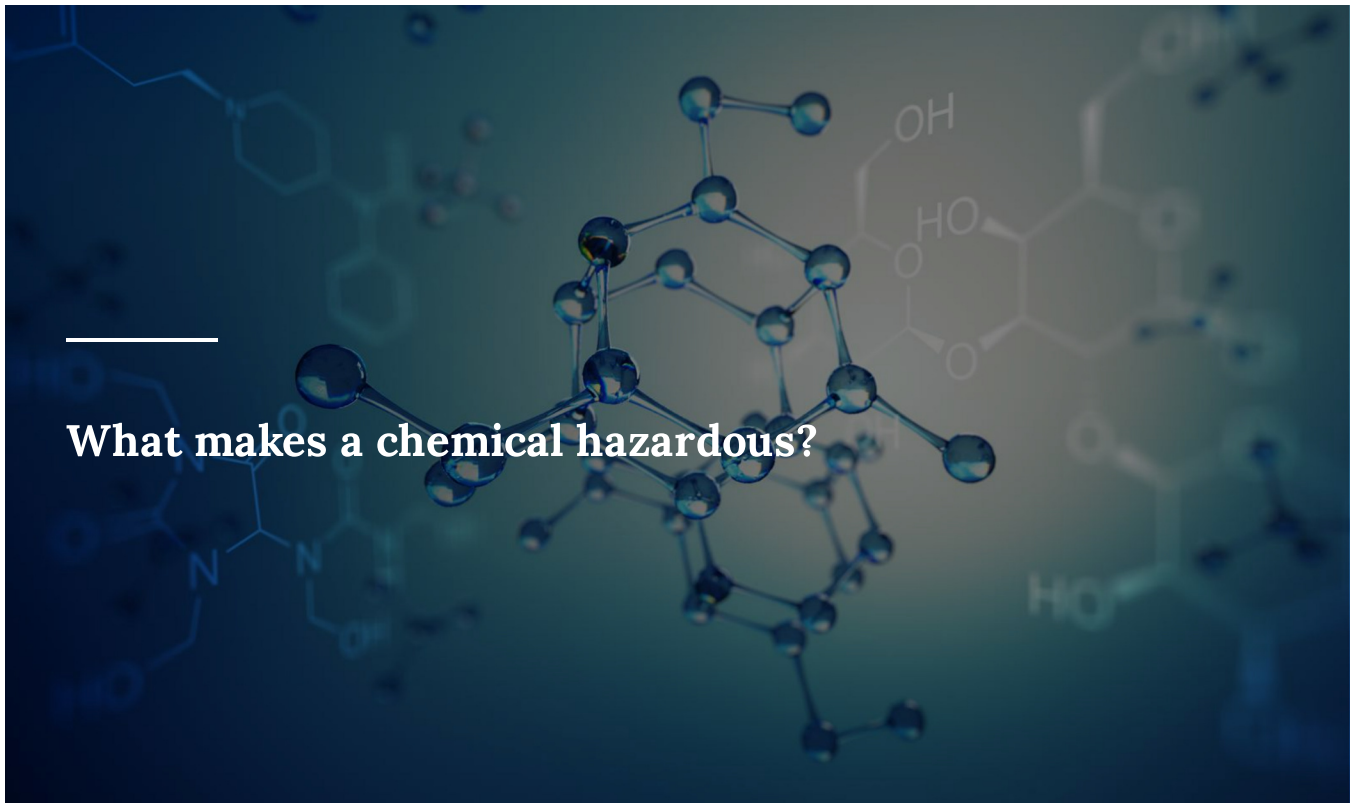
Toxicity

A relative property of a chemical agent that refers to a harmful effect on some biological mechanism and the conditions under which this effect occurs

Let's get started!

CONTINUE

Chemical Hazards





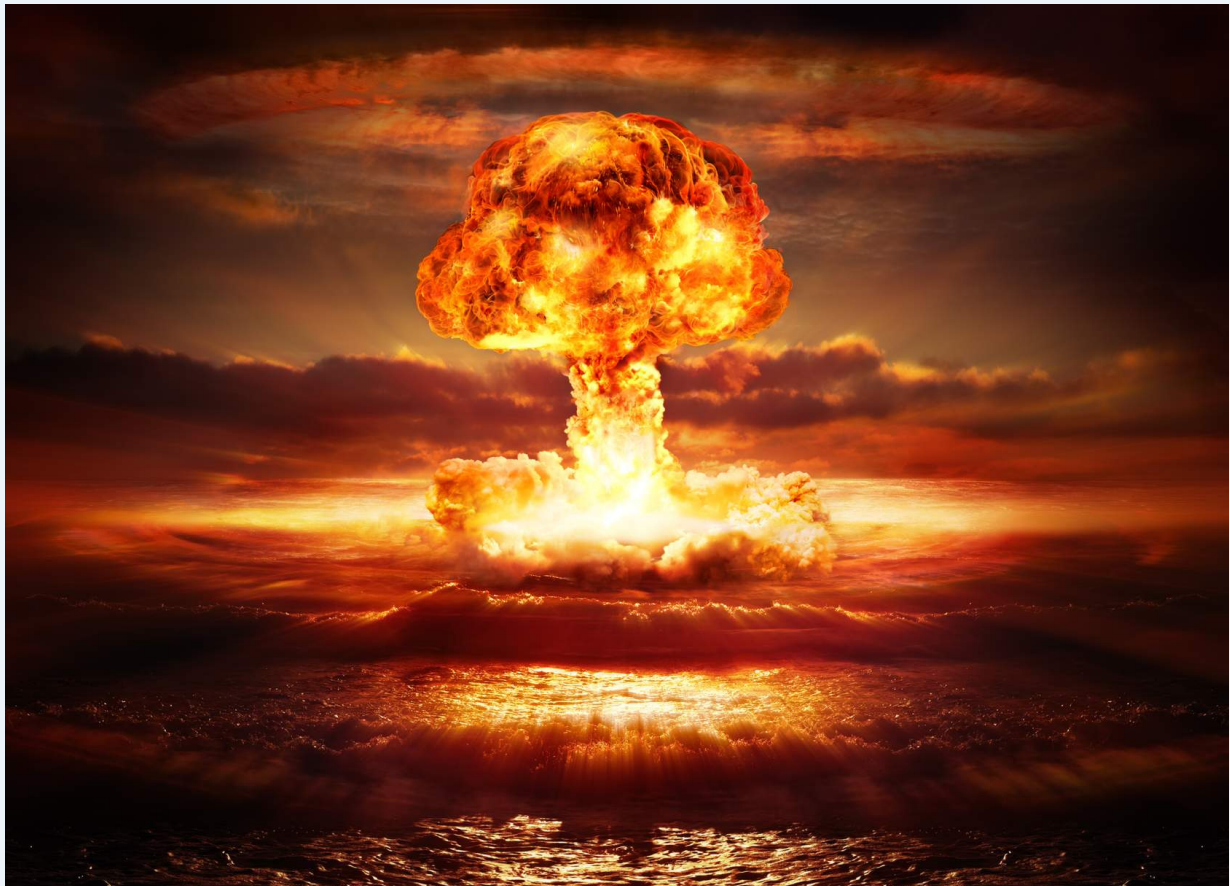
Chemicals are considered hazardous if they can **cause harm**.

OSHA defines two types of chemical hazards, **physical** and **health**.

We will start with physical hazards.

CONTINUE

Physical Hazards



A chemical is a **physical hazard** if it can:

- Burn or support fire
- Cause an explosion
- React on its own or when exposed to water

Combustible liquids, compressed gases, and flammable liquids are types of chemicals that can cause physical hazards.



Kerosene is an example of a combustible liquid.

Hydrogen and nitrous oxide are examples of compressed gasses.

Gasoline is an example of a flammable liquid.

Next, we will review health hazards.

CONTINUE

Health Hazards



A chemical is a **health hazard** if it can cause **harm to humans**.

Chemicals can be **toxic**, **corrosive**, or **carcinogenic**.

Exposure to these chemicals may cause injury or illness. Prolonged exposure to some chemicals can cause chronic or fatal illnesses.

Chemicals can enter the body through the **eyes, nose, mouth, or skin.**



Chemicals splashing in your eyes can cause eye damage, pain, and burning.



Inhaling vapor, mists, or dust can cause irritation of the nose, throat, and lungs.



Accidentally swallowing chemicals can cause irritation to the throat and damage to organs.



Spilling chemicals on your skin can cause damage, pain, and burning.

In healthcare, chemicals may be used to treat individuals. They can also be used to clean, disinfect, and sterilize work areas and medical supplies. A few examples include **cleaning products, disinfectants, and anesthetic gases.**

Choose the best option and click **SUBMIT**.

What makes a chemical a health hazard?

- It can cause harm to human health.
- It can cause an explosion.

SUBMIT



Complete the content above before moving on.



OSHA Hazard Communication Standard

OSHA's Hazard Communication Standard (HCS) requires employers with chemicals in the workplace to have a written hazard communication program in place. **Every** hazardous chemical in the workplace needs a **chemical-specific label** and an available safety data sheet (SDS).



Before using any chemical, you should be trained to **read and understand** labels and SDSs.

In addition, there should be procedures in place in the event of an emergency related to exposure to hazardous chemicals.



We will review chemical labels next.



CONTINUE

Labels and Pictograms



Manufacturers of chemicals have to classify the hazards that the chemicals may cause. They provide these **warnings on labels**. Labels also explain proper storage techniques or what first aid would be needed in the event of exposure.

Hazardous chemicals in your workplaces have to **be labeled**. To work safely with chemicals, you need to understand the words and symbols displayed on these labels.

The image below is an **HCS-compliant label**. Each chemical label should contain the six elements identified.

Select each number to learn more.

1 Formaldehyde

2 **Danger!**

3 **Hazards:** Causes severe eye damage

4

5 **Precautions:** Use in a ventilated area. Use gloves and eye protection.

6 ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

1 Formaldehyde

Danger!

Hazards: Causes severe eye damage

Precautions: Use in a ventilated area. Use gloves and eye protection.



ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

Product Identifier

The manufacturer determines if this is the chemical name, a code number, or a batch number.

Formaldehyde

2 Danger!

Hazards: Causes severe eye damage

Precautions: Use in a ventilated area. Use gloves and eye protection.



ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

Signal Word

This is either "Danger" or "Warning." "Danger" is used for severely hazardous chemicals.

Formaldehyde

Danger!

3 Hazards: Causes severe eye damage



Precautions: Use in a ventilated area. Use gloves and eye protection.

ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

Hazard Statement

This describes the nature or degree of the hazard. Examples include:

- "May cause fire or explosion"
- "Causes severe eye damage"

Formaldehyde

Danger!

Hazards: Causes severe eye damage

Precautions: Use in a ventilated area. Use gloves and eye protection.



ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

Pictogram(s)

These are symbols used to warn of the specific hazard. A label may contain more than one pictogram.

Formaldehyde

Danger!

Hazards: Causes severe eye damage



5 **Precautions:** Use in a ventilated area. Use gloves and eye protection.

ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

Precautionary Statement

These are recommendations to prevent or lessen effects from exposure. Examples include:

- "Keep away from heat."
- "Wash arms, hands, and face thoroughly after handling."

Formaldehyde

Danger!

Hazards: Causes severe eye damage

Precautions: Use in a ventilated area. Use gloves and eye protection.



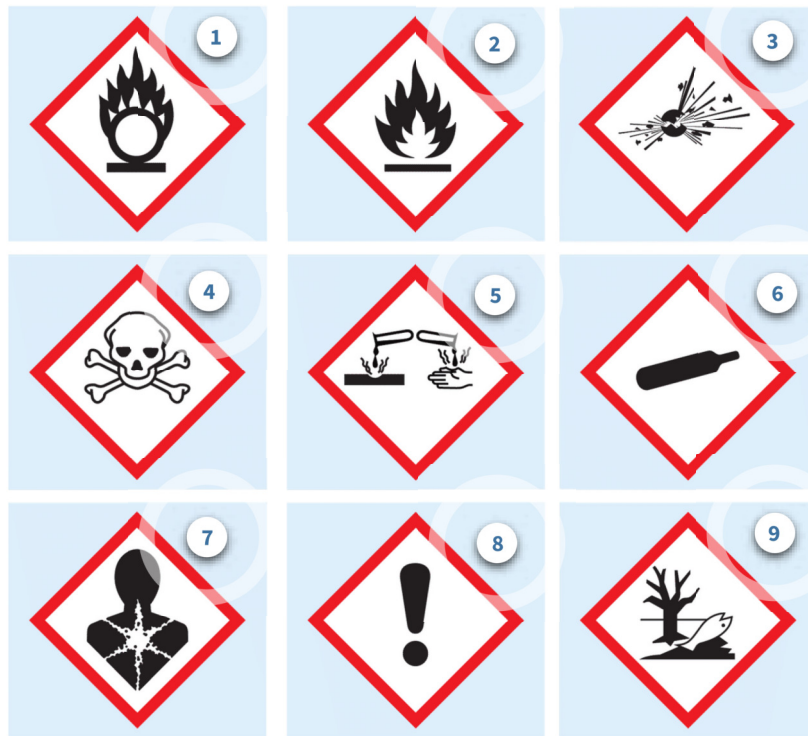
6 ABC Chemicals
1234 Manufacturing Way
Tele: 555-555-5555

Manufacturer's Contact Information

This includes the chemical manufacturer's name, address, and phone number.

There are nine pictograms. One symbol can represent as many as six hazards. We have provided one hazard for each symbol in these examples.

[Select each number to learn more.](#)





The flame over circle symbol means the hazard is an oxidizer.



The flame symbol means the hazard is flammable.



The exploding bomb symbol means the hazard is explosive.



The skull and crossbones symbol means the hazard is acutely toxic (fatal or toxic).



The corrosion symbol means the hazard is skin damage and/or burns.



The gas cylinder symbol means the hazard is gasses under pressure.



The health hazard symbol means the hazard is a carcinogen.



The exclamation mark symbol means the hazard is an irritant.



The environment symbol means the hazard causes aquatic toxicity.


Choose the best option and select **SUBMIT**.

Select the appropriate answer: You are creating a label for a new product that is flammable. Which pictogram is most appropriate?

- Flame over circle
- Flame

- Exploding bomb
- Skull and crossbones

SUBMIT

 Complete the content above before moving on.

Safety Data Sheets

A safety data sheet (SDS) is required to be on file in the workplace for **every hazardous chemical** used. An employee working with chemicals should have access to a paper or electronic version. To protect yourself and your coworkers, you need to know how to read an SDS. Every SDS has 16 required sections.

The image below highlights each of the sections.

The infographic features a blue background. At the top left is an icon of a yellow binder with a white cross. To its right is the text 'CHEMICAL XYZ' with a molecular structure icon. Below this is a white banner with the text 'SAFETY DATA SHEET'. A vertical dotted line descends from the binder icon to two circular icons: a document with a bell and a warning triangle. The first icon is linked to the section '1. Identification', which includes a list of three items: 'Chemical name', 'Name, address, phone and emergency phone numbers of manufacturer', and 'Recommended use and restrictions on use'. The second icon is linked to the section '2. Hazard Identification', which includes the text 'Any chemical hazards and warnings associated with the hazards'.

CHEMICAL XYZ

SAFETY DATA SHEET

1. Identification

- Chemical name
- Name, address, phone and emergency phone numbers of manufacturer
- Recommended use and restrictions on use

2. Hazard Identification

Any chemical hazards and warnings associated with the hazards



3. Composition/Information on Ingredients

Chemical ingredients of substances and/or mixtures (unless a trade secret is involved)



4. First Aid Measures

How to treat, what the symptoms are, and recommendations for any necessary medical treatment



5. Fire Fighting Measures

How to extinguish a fire caused by the chemical, hazards caused by the chemical fire, and recommended protective equipment



6. Accidental Release Measures

How to respond to and clean up spills, leaks, or releases



7. Handling and Storage

How to safely handle and store the chemical



8. Exposure Controls/Personal Protection

Exposure limits for chemical users and recommended measures to prevent injury, such as the specific personal protective equipment (PPE) required



9. Physical and Chemical Properties

Any characteristics of the chemical, such as color, odor, and melting/freezing point



10. Stability and Reactivity

The reactive hazards of the chemical



11. Toxicological Information

The routes of exposure, symptoms after exposure, and whether it is a carcinogen



12. Ecological Information

Environmental impact if released into the environment

Exposure limits for chemical users and recommended measures to prevent injury, such as the specific personal protective equipment (PPE) required



13. Disposal Considerations

Proper disposal, recycling, and safe handling practices



14. Transport Information

Classification for shipping hazardous chemicals by

road, air, sea, or train



15. Regulatory Information

Safety, health, and environmental regulations not listed anywhere else on the SDS



16. Other Information

Date the SDS was created or revised



Choose the best option and select **SUBMIT**.

What information can be found on a safety data sheet?

- The hazard(s) the chemical may cause
- First aid measures
- Personal protective equipment



All of these

SUBMIT

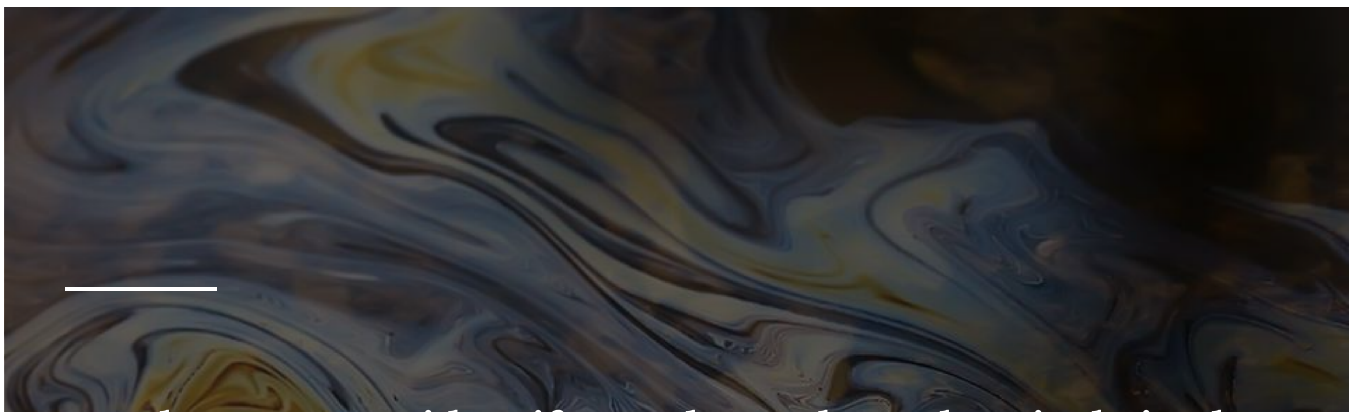


Complete the content above before moving on.

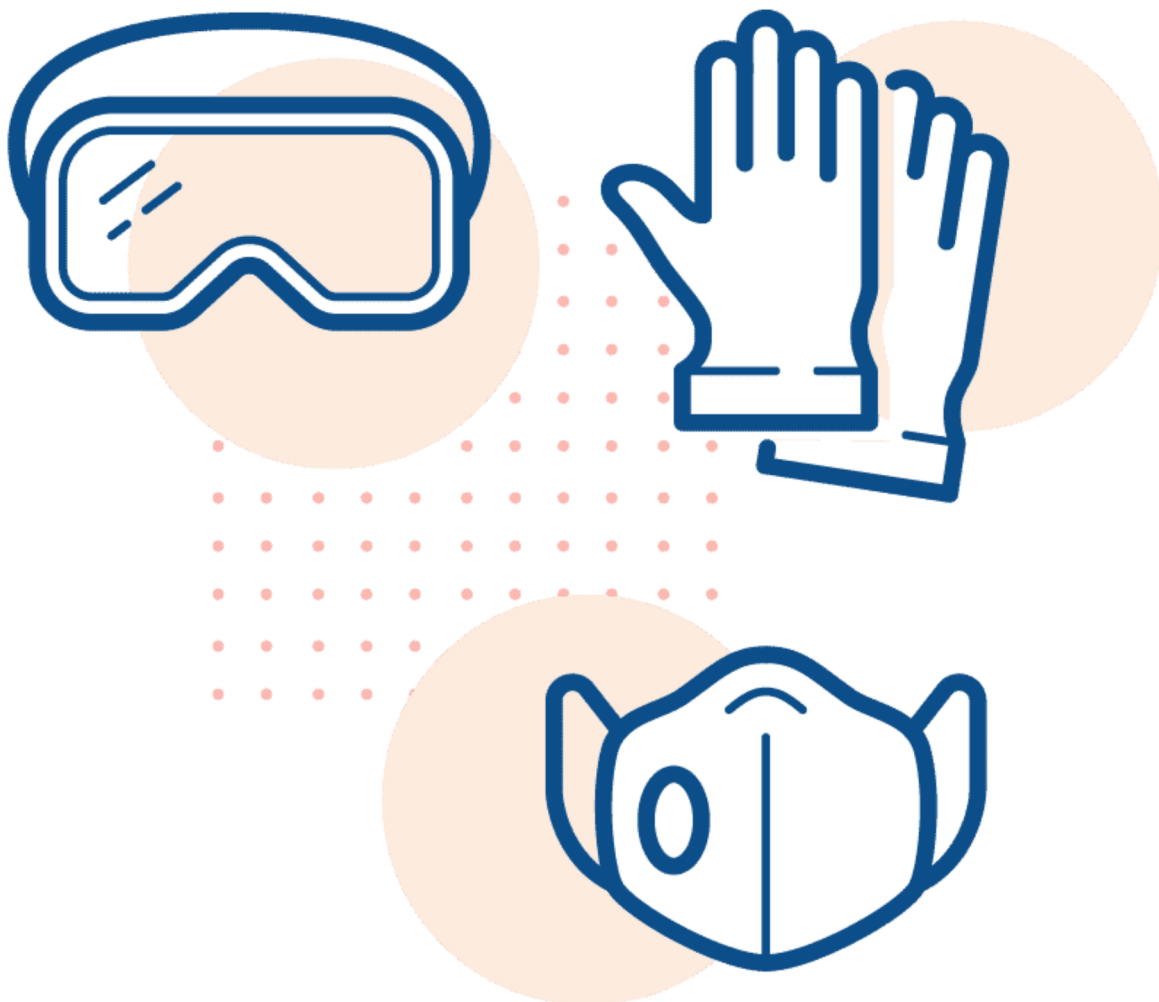
Personal Protective Equipment



Personal protective equipment (PPE) should be used by anyone working with hazardous chemicals. The purpose of PPE is to minimize exposure to hazards that can cause injury or illness.



Employers must identify any hazardous chemicals in the workplace and any PPE needed.

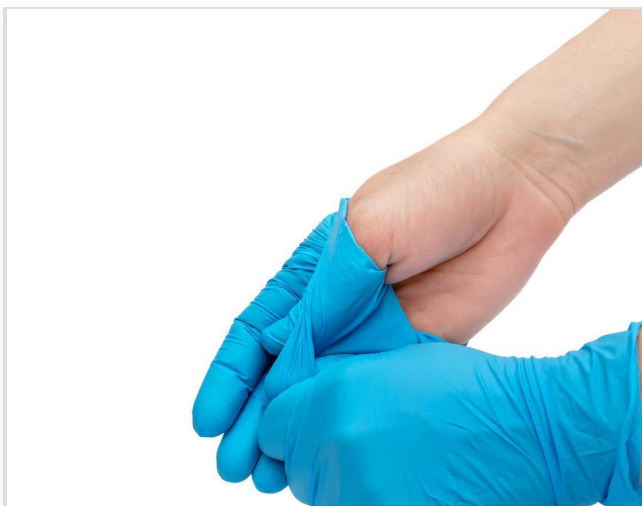


If workers need PPE, employers must supply it and train their employees on:

- When to use PPE
- Which type(s) of PPE to use
- How to put on, adjust, and remove PPE
- Disposal of single-use PPE
- How to store and maintain reusable PPE
- Limitations of PPE

PPE may consist of gloves, protective clothing, respirators, and goggles.

Select each card to view the text.



Gloves protect hands from chemical exposure. The gloves need to be appropriate for the chemical being used.

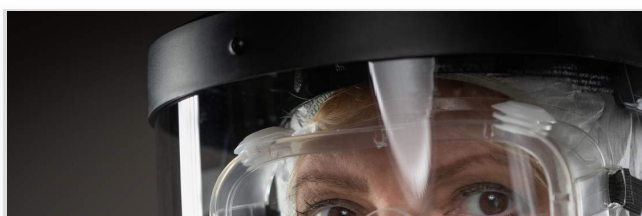


Protective clothing shields skin and clothes from chemical splashes. Gowns and coveralls are examples of protective clothing.



Respirators cover the nose and mouth. They prevent inhalation of hazardous substances. Respirators are only effective if:

- The proper respirator is used.





Goggles protect eyes from chemical splashes. Face shields protect the face. Prescription glasses are not a substitute for goggles.

i The employer must provide any PPE needed when working with hazardous chemicals.

Choose the best option then select **SUBMIT**.

You need PPE to complete your job duties. Who must provide the PPE?

- You must provide the PPE yourself.
- Your employer must provide the PPE.

SUBMIT



Complete the content above before moving on.

Common Hazardous Chemicals

There are many **hazardous chemicals** in the healthcare setting. Let's look at three common chemicals used in healthcare and the risk of exposure to each.

Select each tab to view the text.

FORMALDEHYDE

GLUTARALDEHYDE

ETHYLENE OXIDE (ETO)

Formaldehyde is found in solutions used in **laboratories and operating rooms**. Exposure to formaldehyde can cause an **immune system response** initially. Further exposures may cause **severe allergic reactions** to the skin, eyes, and respiratory tract. Formaldehyde is a **cancer hazard and is also fatal** if ingested (taken by mouth) or inhaled (breathed in) over a long time at low levels in the air.

If there is a chance a person may be splashed with solutions containing 0.1 percent or higher of formaldehyde, the facility has to provide an **eyewash station** near the work area for emergency use.



FORMALDEHYDE

GLUTARALDEHYDE

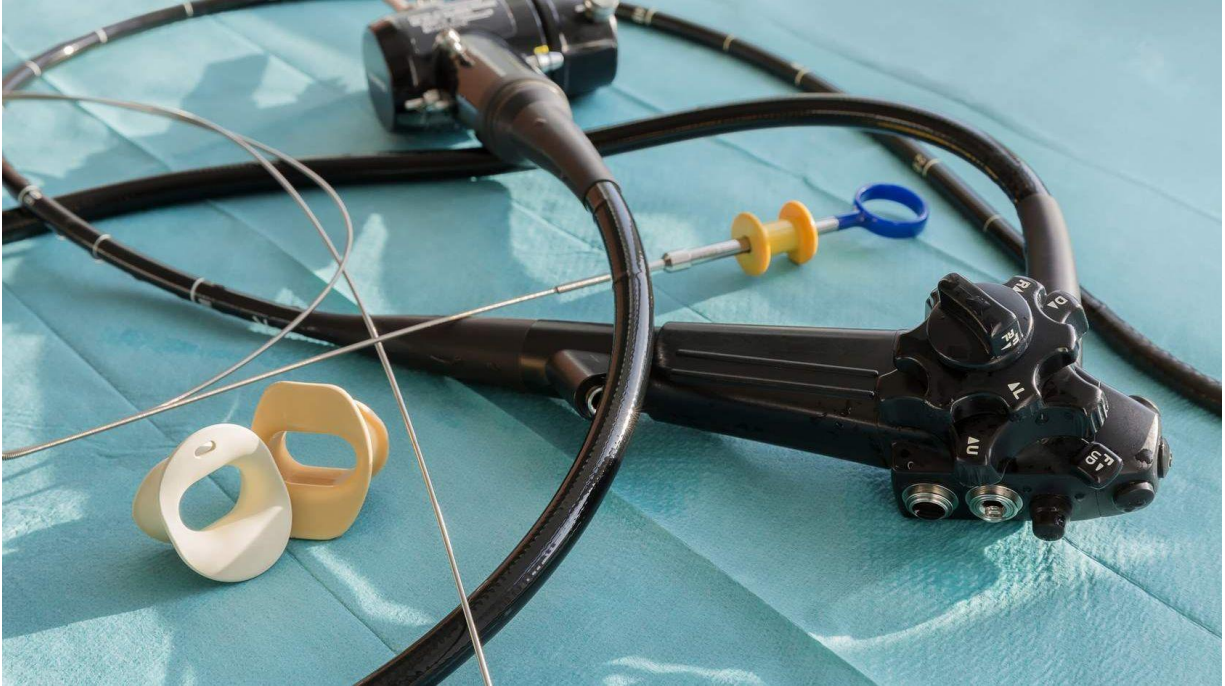
ETHYLENE OXIDE (ETO)

Glutaraldehyde is used as a high-level sterilant. Areas such as dialysis, endoscopy, laboratories, operating rooms (OR), or locations where surgical instruments are sterilized commonly use the chemical.

The following **health effects** have been reported in healthcare workers exposed to glutaraldehyde:

- Asthma-like symptoms and breathing difficulty
- Throat and lung irritation
- Nose irritation, sneezing, wheezing, and nosebleed
- Burning eyes and conjunctivitis
- Rash-contact or allergic dermatitis and hives
- Staining of the hands (brownish or tan)
- Headaches and nausea

Products containing glutaraldehyde should be **stored in closed containers** in well-ventilated areas. As with other chemical irritants, **proper PPE should be worn** when working with glutaraldehyde products, such as goggles, gloves, and gowns. If there is a chance a splash may happen, an **eyewash station** should be nearby.



FORMALDEHYDE

GLUTARALDEHYDE

ETHYLENE OXIDE (ETO)

Ethylene oxide (EtO) is a chemical sterilant. This chemical may be found in procedural areas, laboratories, and instrument processing departments. Before working with EtO, employees should be trained in safe use.

Exposure to EtO usually happens from improper airflow during the sterilizing process. Exposure may also occur during filling and cleaning equipment or a chemical spill. The following **health effects** have been reported in healthcare workers exposed to EtO:

- Eye irritation and injury to the cornea
- Skin irritation and blisters or frostbite

- Lung injury, respiratory irritation, shortness of breath
- Headache, nausea, vomiting
- Cancer, reproductive effects

Proper ventilation is vital when working with EtO gas. Rooms where the gas is being used, should have EtO detector systems and room monitors to signal any gas leaking. Employees should wear **PPE** and be fitted with a **dosimeter** (a device used to measure personal exposure).



Choose the best option and select **SUBMIT**.

Which of the following is a common hazardous chemical in healthcare?

- Formaldehyde
- Glutaraldehyde
- Ethylene oxide (EtO)
- All of these

SUBMIT



Complete the content above before moving on.

Module Conclusion

Remember, knowing the hazards chemicals may cause and wearing PPE will help keep you safe at work.

In this module, you reviewed:

- 1 Hazardous chemicals and the types of hazards they may cause
- 2 How to read labels
- 3 How to read safety data sheets
- 4 Types of PPE

References

Centers for Disease Control and Prevention. (2014, June 6). *Glutaraldehyde – Occupational Hazards in Hospitals*. Retrieved October 28, 2021, from <https://www.cdc.gov/niosh/docs/2001-115/>

New Jersey Department of Health. (2016, April). *Formaldehyde*. Retrieved October 29, 2021, from <https://nj.gov/health/eoh/rtkweb/documents/fs/0946.pdf>

Occupational Safety and Health Administration. (n.d.). *Hazard communication pictograms*. Retrieved September 15, 2021, from <https://www.osha.gov/hazcom/pictograms>

Occupational Safety and Health Administration. (1997, October 3). *Standard Interpretations: Use of latex surgical exam gloves for protection from glutaraldehyde. Standard number 1910.138*. Retrieved October 28, 2021, from <https://www.osha.gov/laws-regs/standardinterpretations/1997-10-03>

Occupational Safety and Health Administration. (2002). *Ethylene Oxide*. Retrieved October 27, 2021, from <https://www.osha.gov/sites/default/files/publications/ethylene-oxide-factsheet.pdf>

Occupational Safety and Health Administration. (2006, April). *Personal protective equipment*. Retrieved September 15, 2021, from <https://www.osha.gov/sites/default/files/publications/ppe-factsheet.pdf>

Occupational Safety and Health Administration. (2011, April). *Formaldehyde*. Retrieved October 29, 2021, from <https://www.osha.gov/sites/default/files/publications/formaldehyde-factsheet.pdf>

Occupational Safety and Health Administration. (2012, February). *OSHA Brief: Hazard communication standard: Safety data sheets*. Retrieved September 15, 2021, from <https://www.osha.gov/sites/default/files/publications/OSHA3514.pdf>

Occupational Safety and Health Administration. (2013, February). *December 1st, 2013, training requirements for the revised hazard communication standard*. Retrieved September 15, 2021, from <https://www.osha.gov/sites/default/files/publications/OSHA3642.pdf>

Occupational Safety and Health Administration. (2013, February). *Hazard communication standard: Labels and pictograms*. Retrieved September 15, 2021, from <https://www.osha.gov/sites/default/files/publications/OSHA3636.pdf>

Occupation Safety and Health Administration. (2013, February 8). *1910.1048 – Formaldehyde*. Retrieved October 29, 2021, from <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1048>

Occupational Safety and Health Administration. (2013, February 8). *1910.1200 – Hazard communication*. Retrieved September 15, 2021, from <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1200>

You have reached the end of this module. To exit and return to the Activity Details, select **EXIT**.

