



## TRAINING KIT FOR: Hazard Communication 2013 Update

*Employee training*  
WAC 296-901-14016



Division of Occupational Safety and Health

[www.Lni.wa.gov/Safety](http://www.Lni.wa.gov/Safety) 1-800-423-7233

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**Hi! This Training Kit** will assist you with meeting the requirements for Employee information and training in the updated Hazcom rules.

**WAC 296-901-14016**  
**Employee information and training.**



Click on this page to open a new window with a PDF copy of the Employee information and training requirements.



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## Contents

- *What's new in Hazcom Training Requirements?*
- **GET READY!** for the required employee training
- **SET!** - Use these slides to develop your own training
- **GO!** train everybody
- **EVALUATE** for effectiveness
- *Web links to useful tools and L&I specialists*

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## What's new in Hazcom Training Requirements?

Review section  
[WAC 296-901-14016](#)  
Employee information and training.

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### Basically the same training requirements

- **LABELS.**  
Employees must be able to interpret the New Labels content and format;
- **SAFETY DATA SHEETS.**  
Employees must be able to follow the standardized format



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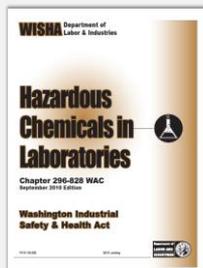
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If you work in a **laboratory**, training requirements in [Chapter 296-828](#) must be followed by your site Chemical Hygiene Plan (CHP).



Click on this book to open a new window with a PDF copy of the Hazardous Chemicals in Laboratories rules, Chapter 296-828 WAC

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## If you already have a working Hazcom Program in place...

...just skip to the slides with information on the updates to the Hazcom required Employee training and information, a.k.a. GHS, short for...

**Globalized Harmonization System.**



[Click on the cheetah to swiftly get to the materials you need...](#)



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## GET READY!

*Follow these steps to prepare for your own training,*

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## GET READY!

I need to make sure that...



Follow this checklist!

1. Computer and internet are working
2. Projector, screen and slideshow ready, or
3. Flipchart and handouts available at the training site
4. Basic information from Hazcom rules was reviewed
5. SDS copies are available for discussion
6. SDS binders or in computer are ready at convenient access points in the worksite
7. I brought chemical containers with new labels for discussion
8. The areas list where hazardous chemicals are in use are posted and visible
9. The list of hazardous chemicals indicating areas of use and storage is available and updated
10. Sampling reports copies are available for discussion
11. Sign-in sheet and employees roster for keeping records of this training

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## Meeting Hazcom Training Requirements

You must also include information specific to your worksite as indicated in Slides with this symbol



Look for this symbol in slides # [64](#), [65](#), [70](#), [71](#), [89](#), [90](#) and [95](#) of this slideshow, to fully meet the training requirements for Hazard Communication

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### SET!

*Invite workers to meet for this training; find an adequate location to have a focused discussion, ...don't forget to bring all the props you prepared.*

Photo by Tracy Hunter on Creative Commons

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## Meeting DOSH Training Requirements

- Preview this program and include your specific workplace information before conducting the training
- You may keep an attendance roster for your records to document training



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## How to use this PowerPoint Slideshow

- You can download, edit, and use these slides for training,
- You may need a laptop computer with PowerPoint and a projector,
- If you want to print out these slides, the PDF file uses less computer memory and prints faster,



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## How to use this PowerPoint Slideshow

- Review, practice the instructor's notes under each slide
- You can read the text in quotations or use your own words
- Additional information is also found in the notes under each slide



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**GO!**

*You are performing!  
Planning and rehearsing  
is paying off. Your  
employees will remember  
a fun, rewarding  
experience.*

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**This training will cover the following:**

- What are hazardous chemicals
- How hazardous chemicals affect the body
- What are the different types of hazardous chemicals



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**This training will cover the following:**

- What is on product labels
- What are Safety Data Sheets
- How to protect yourself from hazardous chemicals.



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**What is Hazard Communication?**

*a.k.a. "Hazcom"*



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## What is hazard communication?

- Hazard communication or "Hazcom" is our company program where we tell you about the hazardous chemicals used in our workplace.



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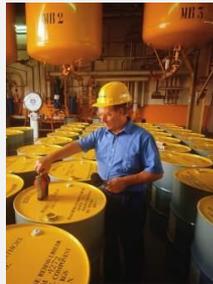
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## What is hazard communication?

- You will learn how to protect yourself from the effects of these hazardous chemicals.
- Hazcom training is required by L & I\* – DOSH\*\*.
- \*L&I: Department of Labor and Industries
- \*\*DOSH is the Division of Occupational Safety and Health



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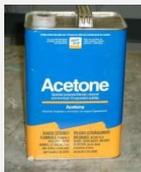
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## What is a hazardous chemical?

- A hazardous chemical is any chemical that can do harm to your body.
- Most industrial chemicals can harm you at some level.
- It depends how much gets into your body.



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## How do hazardous chemicals affect the body?

- It depends on several factors:
  - How the chemical enters the body
  - The physical form of the chemical
  - The amount of chemical that actually enters the body - the dose
  - How toxic (poisonous) the chemical is



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## How Chemicals Enter the Body

1. Inhalation. Breathing in the chemical



2. Absorption. The chemical soaks through the skin (wet on the hands, forearms, eyes, face)



3. Ingestion. Swallowing the chemical



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## Inhalation (Breathing)

- Chemicals in the air are breathed in through the mouth or nose.
- Gases & vapors are absorbed through the lungs directly into the bloodstream.



Video from YouTube: All of the breathing occurs because of the respiratory system.

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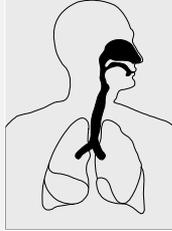
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## Inhalation (Breathing)

- The size of dust particles or mist droplets can affect where the chemical settles in the respiratory tract.



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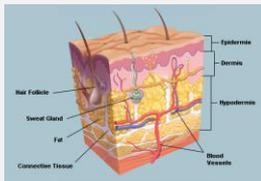
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## Skin Absorption

- Some chemicals can pass through the skin into the body.
- These chemicals can then cause various health effects.



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## Ingestion (Swallowing).

- Chemicals that are swallowed are absorbed in the digestive tract.
- Chemicals can rub off dirty hands and contaminate food, drinks or tobacco products.
- Chemicals in the air can settle on food or drink and be swallowed.



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## All chemicals exists in one of three forms:

1. Solid. Like wood dust



2. Liquid. Like isopropyl alcohol



3. Gas. Like industrial gases



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## Hazardous Chemicals - Dusts

- Some chemicals are solids in the form of powders or dust.
- Dust can be released into the air by cutting, drilling, grinding or sanding.
- Dust can also be stirred up by dry sweeping and inhaled.



Image by Kate Tor Haar Creative Commons

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## Hazardous Chemicals - Dust



- Dust in the air can settle out on work surfaces, cups, plates, utensils, and food.
- The settled dust can be swallowed with food or drinks.
- If the dust is hazardous, it can cause health problems.

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## Solids – Fumes and Fibers

- Fumes are extremely small droplets of metal formed when the metal has been vaporized by high temperatures (usually welding)
- Some solids are fibers which can be similar to dusts but they have an elongated shape (like asbestos or fiberglass)



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## Hazardous Chemicals - Liquids

- Liquid chemicals in direct contact with the skin can cause skin problems.
- Some liquids can be absorbed into the body through the skin.
- Liquids can be sprayed and form mists or evaporate and form vapors which can be inhaled.



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## Liquids (Mists)



Photo by rawforbeauty.com

- Mists can also be inhaled.
- Mists can settle on the skin and be absorbed into the body.
- Airborne mists can also settle out and contaminate food or drink.

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## Gases and Vapors

- Gases are chemicals that are in the gas phase at room temperature.
- Vapors evaporate from substances that are liquids or solids at room temperature.
- Gases and vapors enter the body by inhalation.



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## Toxicity: how poisonous are chemicals?

- Dose  
The effects of any toxic chemical depends on the quantity of a chemical that actually enters the body.



Photo by Jeany Lee Silver Creative Commons

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## Toxicity: how poisonous and rapidly chemicals affect you?

- Acute Toxicity  
The measure of how toxic a chemical is in a single dose over a short period of time.
- Chronic Toxicity  
The measure of the toxicity of exposure to a chemical over a long period of time.

This is the pictogram for Acute Toxicity chemicals in the new label design requirements.



This is the pictogram for Chronic Toxicity chemicals in the new label design requirements.



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## How poisonous are chemicals?

- Some chemicals will only make you sick if you get an “acute” or high dose all at once. Example – ammonia
- Some chemicals are mainly known for their chronic or long-term effects. Example – asbestos
- Most chemicals have both acute and chronic effects. Example – carbon monoxide



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## Do toxic chemicals attack specific body parts?

Some chemicals will affect a particular organ rather than the whole body.



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## How much is too much chemicals exposure?

- Many chemicals have exposure limits, or allowable amounts of a chemical in the air.
- These limits are often called “Permissible Exposure Limits -PELs” or “Threshold Limit Values - TLVs”.

Chemical	TLV	PEL	Other	Notes
Ammonia	10 ppm	35 ppm	50 ppm	TLV is 10 ppm, PEL is 35 ppm, Other is 50 ppm
Asbestos	0.1 f/cc	0.1 f/cc	0.1 f/cc	TLV, PEL, and Other are all 0.1 f/cc
Carbon Monoxide	50 ppm	50 ppm	50 ppm	TLV, PEL, and Other are all 50 ppm
Lead	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	TLV, PEL, and Other are all 0.05 mg/m <sup>3</sup>
Mercury	0.1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	TLV, PEL, and Other are all 0.1 mg/m <sup>3</sup>
Nitrogen Dioxide	5 ppm	5 ppm	5 ppm	TLV, PEL, and Other are all 5 ppm
Ozone	0.1 ppm	0.1 ppm	0.1 ppm	TLV, PEL, and Other are all 0.1 ppm
Sulfur Dioxide	2 ppm	2 ppm	2 ppm	TLV, PEL, and Other are all 2 ppm
Toluene	100 ppm	100 ppm	100 ppm	TLV, PEL, and Other are all 100 ppm
Xylene	100 ppm	100 ppm	100 ppm	TLV, PEL, and Other are all 100 ppm

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## Are there safety rules to working with carcinogens?

- DOSH has regulations covering the general use of carcinogens, and has specific regulations for several known human carcinogens.



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## Carcinogens

- DOSH has specific regulations on the following carcinogens:

- Vinyl Chloride
- Acrylonitrile
- 1,2-Dibromo-3-chloropropane (DBCP)
- Arsenic
- Ethylene Oxide
- Cadmium
- Butadiene
- Methylene Chloride
- Benzene
- Hexavalent Chromium



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## There are chemicals that affect genetic material!

- **Teratogens**  
Teratogens are compounds that can harm the developing fetus, causing birth defects or death.
- **Mutagens**  
Mutagens cause genetic mutations or changes. These mutations can cause birth defects or other problems in following generations or may lead to cancer in the exposed person.



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## There are chemicals that cause allergic responses.

### ▪ Sensitizers

Sensitizers can "switch on" a reaction in an individual worker.

The reaction to a sensitizer depends upon the individual worker.

Once a worker becomes sensitized to a compound, smaller and smaller exposures can cause a reaction, and the reactions can become more severe.



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## There are chemicals that cause injuries, burns.

▪ Acids and bases (caustics) are common corrosive chemicals.

▪ Corrosive chemicals are capable of damaging eyes, skin and the respiratory system.



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## Corrosive Chemicals - Skin

▪ Corrosives can cause visible skin burns or damage.

▪ The extent of skin damage depends on how long the corrosive is on the skin and how concentrated the corrosive is.



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## Corrosive Chemicals - Inhalation and Eyes

- Inhalation of corrosive mists or vapors can cause severe bronchial irritation.
- Corrosives are especially damaging to the eyes.



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## Examples of Corrosive Chemicals

- Sulfuric Acid
- Ammonia
- Chromic acid
- Lye
- Acetic Acid
- Chlorine



Photo by Mark Miller in Creative Commons  
Batteries contain sulfuric acid

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## For protection against corrosive chemicals use...



- Protective gloves & clothing  
Eyewashes



Goggles  
Water (for splashes  
on the skin)

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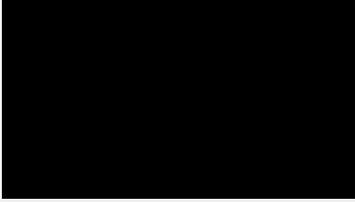
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## There are liquids that can ignite!



- The vapor of a flammable liquid ignites and causes fire or explosion – not the liquid itself.
- The flammability of a liquid depends on its physical properties:
  - A. Vapor Pressure
  - B. Flash Point
  - C. Limits of Flammability
  - D. Vapor Density

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## Flammable liquids generate Vapor Pressure



- Vapor Pressure is a measure of how fast a liquid evaporates.
- The higher the Vapor Pressure the more rapidly the liquid will evaporate.
- Vapor Pressure goes up and down with the temperature of the liquid.

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## Flammable Liquids - Flashpoint

- The flash point is the lowest temperature that a flammable liquid can generate enough vapor to form a mixture with air that will ignite.



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## Are there limits for Flammability?

Lower Explosive Limit - LEL      Upper Explosive Limit - UEL



- The limits of flammability mark the range that a mixture of air and vapor is flammable.
- Mixtures can be too lean (not enough vapor) or too rich (too much vapor) to ignite and burn.

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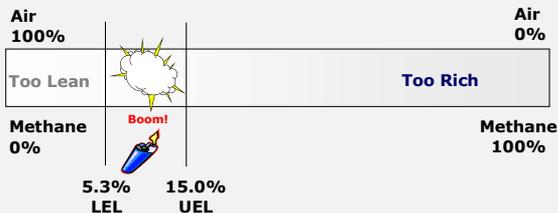
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## Explosive Limits Example

Methane



LFL = Lower explosive limit    UFL = Upper explosive limit

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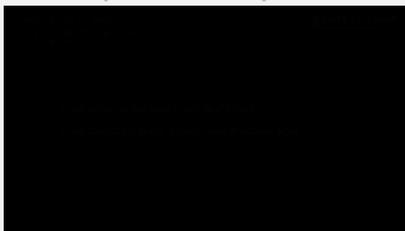
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## Flammable Liquids Lower Explosive Limit (LEL)



- In most work situations, the "lower explosive limit" (LEL) is the main concern.
- Vapors from flammable liquids can be found in the workplace, but are often too diluted to catch fire or explode.
- However, these vapors can quickly go above the LEL in small room or confined space like a tank.

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## Flammable Liquids Vapor Density



- "Vapor density" is a measure of how heavy a vapor is compared to air.
- Vapors with a density greater than air can flow like a liquid collect near the floor.
- This may create a fire or explosion hazard if the vapor flows to an ignition source.

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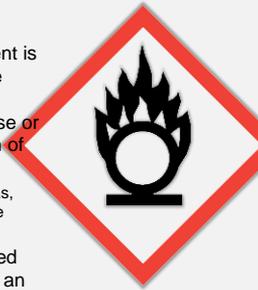
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## Oxidizer

- An oxidizer or oxidizing agent is a substance that may not be combustible itself, but by producing oxygen, may cause or contribute to the combustion of other material.
  - A. Examples include oxygen gas, hydrogen peroxide and some acids.
- A flammable substance mixed with an oxidizer will result in an explosion



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## Hazards of Metals

- Metals can be both physical hazards and health hazards.
- Some metals can ignite and explode – magnesium, lithium or dusts/filings of other metals such as aluminum
- Some metals are almost non-toxic – iron, aluminum
- Others are very toxic – mercury, lead, cadmium, beryllium



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This is the list of operations and work areas where hazardous chemicals are present

- [List where hazardous chemicals are used]



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The following products are used at our site: \_\_\_\_\_

- [List products and where they are used]



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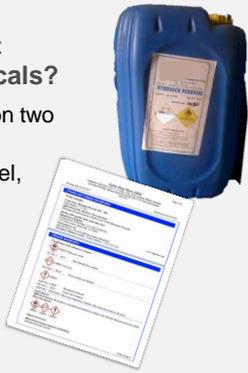
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## How do you get information about hazardous chemicals?

You can get information two ways:

- from the product label,
- from the product Safety Data Sheet or SDS.



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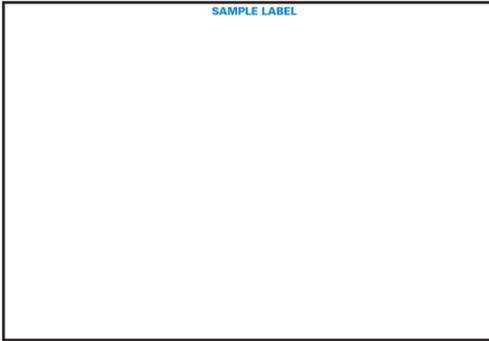
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## What must be on the product label?

SAMPLE LABEL



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## Why I must review a Safety Data Sheet or SDS?

1. **Ingredients.** Tells you what chemicals are in the product



Product identifier  
Trade name: Hydrogen Peroxide, 30% - 40%  
CAS Number: 7722-84-1  
Synonyms or Alternative Names: Hydrogen Peroxide, Aquinox Solution (with 30-40% Hydrogen Peroxide)

2. **Hazards.** Informs you of the hazards in the chemical



3. **Safe handling.** Also gives you instructions how to protect yourself



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## The four pictograms on the label are telling you...

- DANGER!
- Causes severe skin burns and eye damage;
- Do not breath dusts or mists;
- If swallowed: Rinse mouth. DO NOT induce vomiting;
- Store locked up
- Etc.



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## This label is warning you of multiple hazards. Find how can you protect yourself.

**EPICHLOROHYDRIN** 1

UN No. 2023  
CAS No. 106-89-8

**2 DANGER**

4 Flammable liquid and vapor. Toxic if swallowed. Toxic in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause cancer.

5 Do not breathe dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection.

Fill Weight: 18.52 lbs. Lot Number: A0323111323  
Gross Weight: 20 lbs. Fill Date: 1/15/2012  
Expiration Date: 1/15/2018

JACKSON CHEMICAL COMPANY - City of Industry, Los Angeles, California, USA (800)444-456-8989

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## Another Example Label

Signal Word      Product Identifier      Pictogram

**ToxiFlam (Contains: XYZ)**

**Danger! Toxic If Swallowed, Flammable Liquid and Vapor**

**Hazard Statement**

Do not eat, drink or use tobacco when using this product. Wash hands thoroughly after handling. Keep container tightly closed. Keep away from heat/sparks/open flame. – No smoking. Wear protective gloves and eye/face protection. Ground container and receiving equipment. Use explosion-proof electrical equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place.

**Precautionary Statement**

**IF SWALLOWED:** Immediately call a POISON CONTROL CENTER or doctor/physician. Rinse mouth.

In case of fire, use water fog, dry chemical, CO<sub>2</sub>, or "alcohol" foam.

See Material Safety Data Sheet for further details regarding safe use of this product

MyCompany, MyStreet, MyTown, NJ 00000, Tel: 444 999 9999

**Contact Information**

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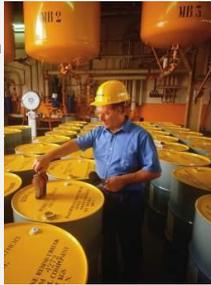
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Where in the label can I learn how to protect myself from the effects of the chemical?

Correct! The Precautionary Statement has the information I need...

Keep container tightly closed.  
Keep away from heat/sparks/open flame. No smoking.  
Use only outdoors or in a well-ventilated area.  
Do not breath fume/gas/mist/vapour/spray.  
Wear protective gloves and eye/face protection [as specified...]  
Ground/bond container and receiving equipment.  
IN CASE OF FIRE use [as specified] for extinction  
FIRST AID  
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.  
Call a Poison Center or doctor/physician if you feel unwell.  
Store in a cool, well-ventilated place.



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### What do these 9 pictograms mean?



Extremely Toxic



Toxic



Health Hazard



Corrosive



Explosive/Reactive



Flammable



Gas Under Pressure



Oxidizer



Aquatic Toxicity

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### These are the 3 pictograms used for warning of Health Hazards

- These first 3 pictograms cover health hazards of chemicals that can harm you if they get inside your body.



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**Acute Toxicity**



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**Toxic**



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**Chronic  
Health  
Hazard**



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## Physical Hazards

- These 5 pictograms warn of physical hazards – the chemical will either chemically burn your skin, blow up, burn up or make a fire worse.



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## Corrosive



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## Flammable



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**Explosive**



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**Oxidizer**



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**Gas Under Pressure**



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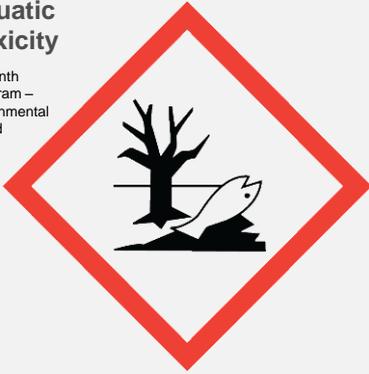
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## Aquatic Toxicity

- The Ninth Pictogram – Environmental Hazard



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In our site, Safety Data Sheets or SDS are located in *the following locations*

[ List locations, or contact name to find SDSs ]



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The air sampling results can be found at the following location

[ Provide location information and directions here ]



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**You can protect yourself from hazardous chemicals by:**

- Knowing what's in the products you work with,
- Using the smallest amount of a chemical to do the job,
- Maintaining machinery and equipment to prevent leaks or releases,



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**Also you should consider protection from hazardous chemicals by:**

- Using available ventilation to reduce amounts of chemicals in the air,
- Keeping lids, doors or covers closed on chemical processes,
- Wearing necessary personal protective equipment.



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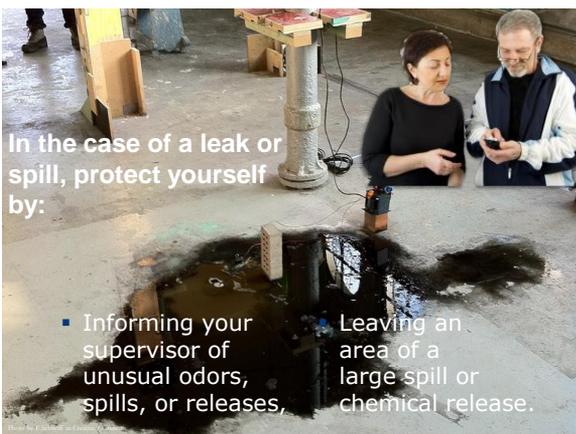
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**In the case of a leak or spill, protect yourself by:**

- Informing your supervisor of unusual odors, spills, or releases,
- Leaving an area of a large spill or chemical release.



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### Question 1

What are the three routes of entry of chemicals into the body?

- a) Ears, eyes and mouth
- b) Nose, mouth and skin
- c) Swallowing, inhaling and drinking
- d) Ingestion, inhalation and absorption



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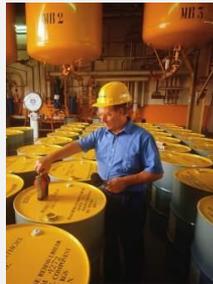
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### Question 2

What is acute toxicity of a chemical?

- a) A good-looking chemical
- b) The chemical is toxic only if you drink it
- c) The chemical will harm you only after years of exposure
- d) The chemical can harm you in a single dose over a short period of time



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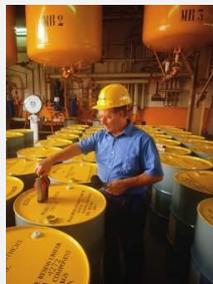
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### Question 3

When is a chemical vapor flammable?

- a) Only if it is really hot
- b) Only when the amount is above the UEL
- c) When the amount in the air is above the LEL
- d) Whenever there is an open flame



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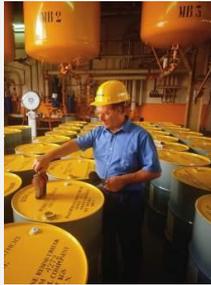
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### Question 4

How can you find out what chemical is in a product we use?

- a) Ask your supervisor
- b) Look on the label
- c) Read the SDS
- d) Ask your co-worker



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### Question 5

What should you do if there is a large chemical spill in your work area?

- a) Run out of the building
- b) Leave the area and inform your supervisor and coworkers
- c) Clean it up right away
- d) Call 911



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### Question 6

Which one of these pictograms means the product is flammable?

- a) 
- b) 
- c) 



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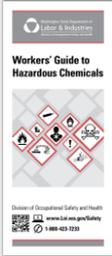
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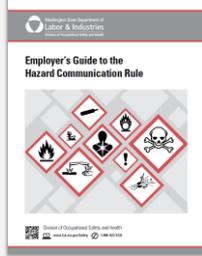
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Click on any of these links for additional support sources...



Chemical Hazard Communication Program

Sample



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Links to additional support sources

- ✓ [Request Consultation](#)
- ✓ [Hazard Communication and the Globally Harmonized System \(GHS\)](#)

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