Chemical Hazard Communication

Training course for employees

January, 2020

Note: all photos are from AdobeStock unless otherwise indicated.
What is chemical hazard communication?

It the requirement that we inform you:
what chemicals you work with,
what are the hazards of those chemicals,
how you can get more information about them,
how you can protect yourself from the hazards.
What this training will cover

What are hazardous chemicals,
How chemicals can affect your body,
What are the different types of hazardous chemicals,
What is on chemical product labels,
What are safety data sheets,
How to protect yourself from hazardous chemicals.
What are hazardous chemicals?

A hazardous chemical is any chemical that can do harm to your body.

Nearly every chemical can harm you at some level.

Some chemicals can harm you in tiny amounts - others will cause harm only in large amounts.

It depends on how much gets into your body.
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 that actually enters the body,
- how toxic (poisonous) the chemical is.
The three ways chemicals can enter the body

**Inhalation** – breathing the chemicals into the lungs, **absorption** – the chemicals soak through the skin, or **ingestion** – swallowing the chemicals
Inhalation

Chemicals in the air can be breathed in through the nose or mouth.

Gases and vapors are absorbed through the lungs directly into the bloodstream.

Dusts and mists can settle into different parts of the respiratory tract depending on the particle size.
Skin absorption

Some chemicals can pass through the skin into the body and cause health problems.

Some chemicals can affect the skin directly causing irritation or dermatitis.
Ingestion (swallowing)

Chemicals can rub off dirty hands and contaminate food or drink.

Chemicals in the air can settle on food or drink and be swallowed.

Chemicals that are swallowed can be absorbed in the digestive tract.
Chemicals exist in one of three forms

**Solid** – like rocks, metal, chunks, powder or dust. **Liquid** – like water in a container or as a spray or mist. **Gas and vapors** – like the air, usually invisible.

Solid (dust)  
Liquid  
Gas
Hazardous solid chemicals – dusts and powders

Dusts can be released into the air by grinding, cutting, sanding, drilling or sweeping.

Some products may be in the form of a powder that is handled and released into the air.

These dusts can be inhaled or settle on food or drink.
Hazardous solids – fumes and fibers

Fumes are extremely small droplets of metals formed from welding.

Some dusts can be in the form of tiny fibers like fiberglass or asbestos.

Magnified asbestos fibers
Hazardous liquid chemicals

Liquid chemicals in direct contact with the skin can cause skin problems.

Some liquids can be absorbed into the body through the skin.

Some liquids can evaporate and form vapors that can be inhaled.
Hazardous liquid sprays and mists

Mists and sprays can also be inhaled.

Mists and sprays can land on the skin, causing health problems.

Mists and sprays can also land on food or drink and be ingested.
Hazardous gases and vapors

Gases and vapors enter the body by inhalation.

Vapors are gaseous forms of liquids.

Most solvents emit vapors.
Chemical toxicity – how poisonous chemicals are

The effect of any chemical depends on the amount of chemical that actually enters your body.

This is called the dose.

The larger the dose, the greater the effect.
Acute and chronic toxicity

Some chemicals will only make you sick if you get an “acute” or high dose all at once, like ammonia.

Some chemicals affect you mainly if you have long-term or “chronic” exposure, like asbestos.

Most chemicals will have both acute and chronic effects, like carbon monoxide.
How much is too much chemical exposure?

Many chemicals have workplace exposure limits or allowable amounts in the air that people can be exposed to without known harmful effects.

These limits are called “permissible exposure limits - PELs” or “threshold limit values - TLVs”
L & I’s permissible exposure limit list

### Chapter 296-841 WAC
#### AIRBORNE CONTAMINANTS

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Chemicals can have the following effects:

- cause cancer,
- harm a fetus in the womb,
- cause genetic mutations and birth defects,
- affect specific organs in the body,
- cause sensitization (allergic effects).
Other hazards of chemicals

Besides toxic effects, chemicals can be flammable, explosive, corrosive or act as oxidizers.

The effects of these type of chemicals is often immediate and severe.
Flammable/combustible liquids
Includes fuels and many solvents

YouTube video – flammable versus combustible
Flammable/combustible liquids - flashpoint

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

Chemicals with a low flashpoint ignite easily. Examples: gasoline, acetone
Limits of flammability

- 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.
Explosive/flammable limits example

LEL—lower explosive limit  UEL—upper explosive limit
Vapor density

Another property of vapors is vapor density – the vapor is either heavier than air or lighter than air.

The vapors from liquids with a vapor density greater than one, will be heavier than air and will tend to collect in low points - near the floor.
Corrosive chemicals

Corrosive chemicals cause chemical burns to the eyes, skin and the lungs if inhaled.

They include acids and caustics (bases).

The extent of harm depends on how concentrated the corrosive is and if the corrosive can be washed out of the eyes or off the skin immediately.
Examples of corrosive chemical effects

- skin acid burn
- eye damaged by caustic
Hazards of metals

Metals are most hazardous as a dust or welding fume.

Some metals are combined with other elements, but can still be quite toxic.

Some extremely toxic metals are lead, mercury, cadmium, beryllium and certain chromium compounds.

Mercury drops – highly toxic!
How to find out about hazardous chemicals

Two ways:

chemical product labels

safety data sheets
What must be on the product label?

Six things:
- product name
- signal word
- hazard statement
- pictogram
- precautionary statement
- name, address and telephone number of the manufacturer
Acetone

Danger!

Highly flammable liquid vapor. Causes severe eye irritation.

Keep away from heat, sparks and flame – No smoking. Take precautionary measures against static discharge. Keep from direct sunlight. Keep container closed when not in use. Store in a cool/low temperature, well-ventilated place away from heat and ignition sources. Use only in a well-ventilated area. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment, avoid direct contact.

IF CONTACT WITH EYES: Flush eyes with water for at least 15 minutes while holding eyelids open.
In case of fire, use water spray, fog or mist. Dry chemicals. Halon. Powder, foam or CO2.
See Safety Data Sheet for further details regarding safe use of this product.

ABC Company, Main Street, Anytown, NJ 00000, Tel: 555 123 4567
What do the nine pictograms mean?

- Extremely Toxic
- Toxic
- Health Hazard
- Corrosive
- Explosive/Reactive
- Flammable
- Gas Under Pressure
- Oxidizer
- Aquatic Toxicity
Extremely poisonous. It will quickly make you very sick or even kill you if you inhale or swallow it, or get in on your skin.
Will cause negative health effects if you inhale or ingest it or get it on your skin.
Will cause negative health effects of you inhale, ingest or get it on your skin over a long period of time.
Corrosive chemicals will cause skin burns or eye damage from a spill or splash or lung damage if inhaled.
Will burn or catch fire.
Will blow up or explode.
These chemicals are not flammable themselves, but can cause a fire by increasing the amount of oxygen in the air. Will cause flammable chemicals to burn hotter and faster.
Any gas stored under pressure
Chemicals that are toxic to fish or other organisms in water. A product is not a hazard to humans if this is the only pictogram.
Safety data sheets

Chemical product labels give only limited information on the hazards of the product.

Safety data sheets have much more information about the hazards of the chemical product.
The safety data sheets are accessible to you and kept in the following location(s):
Handling chemical products may require personal protective equipment (PPE)

Required PPE will depend on the product being used.
Large chemical releases or spills - what to do

Inform your supervisor of unusual chemical odors, spills, leaks or releases.

Immediately leave an area of a large spill or release since you could be overcome by the effects of toxic chemicals.

Don’t attempt cleanup unless you have been trained in emergency response.
Our emergency or chemical spill response is as follows:
We have take the following steps to reduce your exposure to hazardous chemicals:
The hazardous chemicals in use at our workplace are as follows:
We require the following personal protective equipment: