



Northern Illinois
University

Environmental Health and Safety Department

“Everyone. Home. Safely.”

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Welcome to Northern Illinois University’s Hazard Communication Training presentation.

Motto of EHS is “Everyone. Home. Safely.” Which is also the purpose of the Hazard Communication Standard. To keep **you** safe while working with hazardous materials.

Hazard Communication Awareness

29 CFR 1910.1200



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OSHA's Hazard Communication standard mandates that employees have a right-to-know of the associated health and safety hazards of chemicals being used at work. The standard requires us to make sure you understand the steps you can take to protect yourself from chemical hazards in the workplace.

Hazard Communication training consists of two parts: general and work-specific.

EHS provides the general training, which consists of the requirements of 29 CFR 1910.1200, how to read and interpret a SDS, and the elements of the Globally Harmonized System of classification and labeling.

The work-specific training is provided by your department and includes the location of the chemical inventory and associated SDSs, the proper use of PPE, and the emergency procedures to follow if an employee is exposed to a chemical.

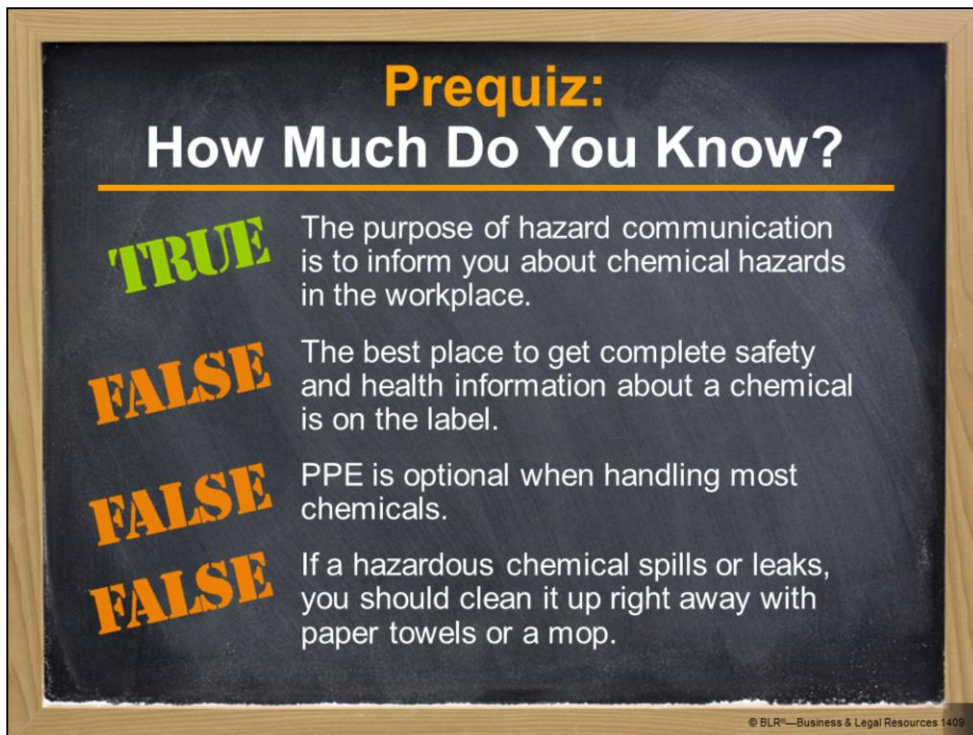
Session Objectives

- Understand the purpose and requirements of OSHA's Hazard Communication standard
- Identify chemical hazards and safe work practices using labels and SDSs
- Understand the effects and symptoms of exposures
- Use appropriate PPE to protect against chemical hazards
- Respond quickly and effectively to spills

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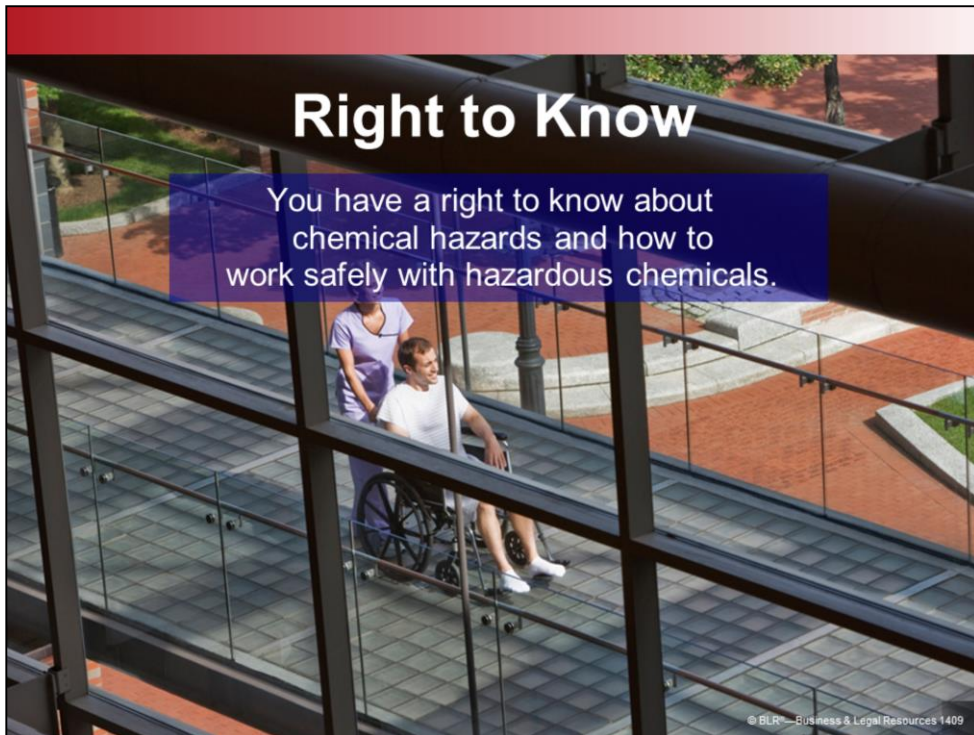
The main objective of this session is to make sure you can identify chemical hazards and take proper precautions to protect your health and safety whenever you work with or around hazardous chemicals. After this session is over, you should be able to:

- Understand the purpose and requirements of OSHA's Hazard Communication standard;
- Identify chemical hazards and safe work practices using labels and safety data sheets, or SDSs;
- Understand the effects and symptoms of exposures and proper first aid;
- Use appropriate personal protective equipment, or PPE, to protect against specific hazards; *and*
- Respond quickly and effectively to spills.



Before we begin the session, let's see how much you already know about hazard communication. Decide which of the statements on the screen are **True** or **False**.

- The purpose of hazard communication is to inform you about chemical hazards in the workplace.
 - This is **true**.
- The best place to get complete safety and health information about a chemical is on the label.
 - This is **false**. (*SDS sheets*)
- PPE is optional when handling most chemicals.
 - This is also **false**. (*Must always be used*)
- If a hazardous chemical spills or leaks, you should clean it up right away with paper towels or a mop.
 - This is also **false**. (*Example: using clay absorbent to clean up an oxidizer*)



- OSHA's Hazard Communication standard says that you have the right to know about chemical hazards in the workplace **and** how to work safely with hazardous chemicals.

The goal is to prevent accidents and injuries by making employees aware of the hazardous chemicals in the workplace **and** how to handle those chemicals safely.

If you feel unsafe or even uncomfortable about working with a chemical you are encouraged to stop work and discuss your concerns with either your supervisor or the EHS Department.

Manufacturers

- Hazards
- Label
- SDS



The image shows a blue and yellow drum with a hazard label. A hand is holding a yellow folder. The background features several hazard symbols: a large exclamation mark, a tree, and a bird. The text 'Manufacturers' is at the top, and a bulleted list is on the left. The text 'Legal Resources 1409' is at the bottom right.

The Hazard Communication standard requires **manufacturers** to provide information about the hazards of their chemicals to help users handle them safely.

The standard requires manufacturers to do three important things.

- First, they must determine what all the health and safety hazards are.
- Next, they must label their containers with this information.
- And finally, they must develop an SDS that contains detailed information about their chemical. Manufacturers must provide an SDS to anyone who purchases the chemical directly from them, as well as to anyone who requests a copy of the SDS.

Employers

- Hazard communication
- List of chemicals
- SDSs
- Training



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Employers have four basic duties under the Hazard Communication standard.

- First, we are required to have a written hazard communication program that describes how we intend to ensure that all employees understand the hazards of chemicals in the workplace.
- Second, we must maintain a list of hazardous chemicals that are used and stored in the workplace.
- Third, we must obtain SDSs from manufacturers, and maintain them in such a way that you and your coworkers have unrestricted access to them at any time.
- Fourth, we are required to train you to make sure you understand chemical hazards and safe work practices. Training must include information about OSHA's Hazard Communication standard, about specific chemicals in the workplace, about how to read and interpret labels, and how to obtain and read SDSs.

Are you familiar with our hazard communication program? Where is the written plan located? Where are your SDS sheets located?

Chemical Hazards

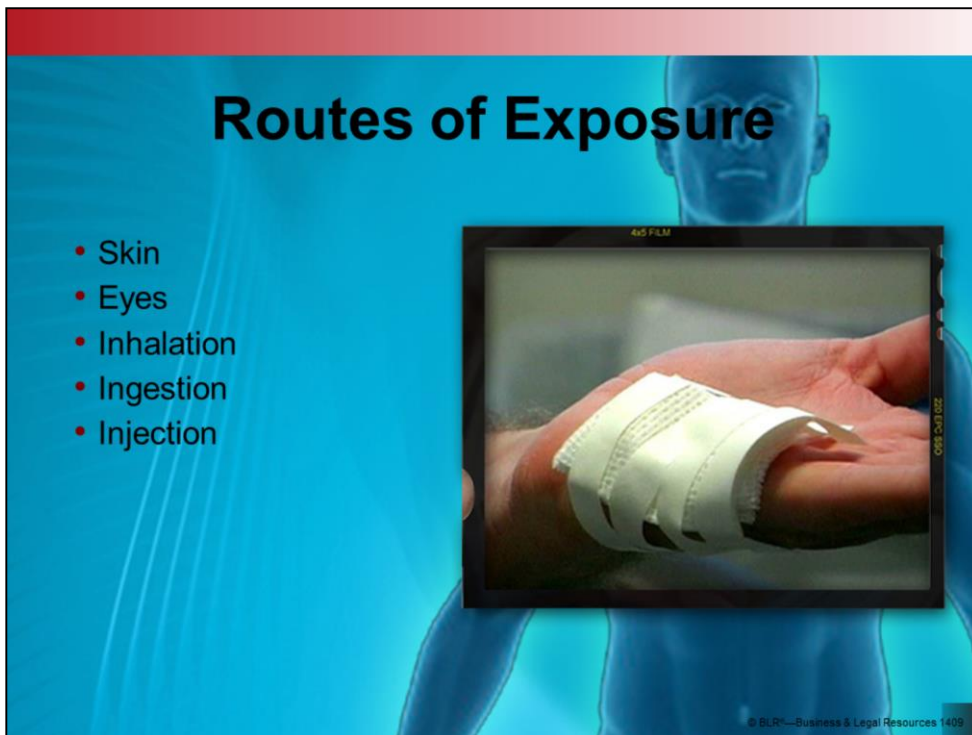
- Flammable/explosive
- Reactive
- Corrosive
- Toxic



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Chemical hazards fall into four categories. A chemical may have only one of these hazard characteristics **or** all four.

- Chemicals that are flammable or explosive are easily ignited by a flame or spark. Examples include propane, gasoline, acetone, and alcohol.
- Reactive chemicals will burn, explode, or release gases after making contact with water, air, or other chemicals. Examples include acetylene, chlorine, and nitric acid.
- Corrosive chemicals will eat through metals, clothing, and human skin. Corrosive materials might be acids or alkalines. Alkalines are also known as caustics or bases. Examples of corrosive materials include sulfuric acid, caustic soda, and sodium hydroxide.
- Toxic chemicals which are any substances that may be harmful to your health if inhaled, ingested or absorbed through the skin. Examples of toxic chemicals include pesticides, solvents, and asbestos.



Recognizing possible ways you could be exposed to hazardous chemicals will help you take the right precautions to protect your health.

- Chemicals can get **on your skin** and cause irritation such as a rash. They can also burn your skin. Some toxic chemicals can be absorbed through the skin, get into your blood stream, and affect target organs.
- If chemicals get **in your eyes**, they will likely cause irritation. Some could even cause serious eye damage that could affect your vision.
- If you **breathe** chemical vapors, gases, dust, or fumes, these contaminants can get into your respiratory system and cause irritation and damage. In high concentrations some chemicals can even prevent you from getting enough oxygen.
- Chemicals can also be swallowed, or **ingested**, when they get on food or into beverages that are later consumed. They can also be swallowed if you touch your mouth with contaminated hands.
- Chemicals can also enter your body by being **injected** under your skin by a sharp object such as a metal edge on a drum lid, a blade, a screwdriver, or a needle.

Effects of Exposure

- Short-term (acute)
- Long-term (chronic)



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The health effects of exposure to hazardous chemicals can be short-term or long-term.

- Short-term effects, called “acute” effects, are typically the result of a brief exposure that occurs once or a few times over a short period. Acute effects generally occur soon after exposure **and** disappear over time once you are no longer exposed to the chemical. Symptoms of a brief exposure might include a rash, dizziness, a headache, or eye irritation.
- Chronic, or long-term effects, are typically the result of being exposed to a chemical over a period of many years, are usually permanent **and** will not disappear even after you are no longer exposed to the chemical. Chronic illnesses can also occur after brief exposures to extremely high concentrations of some chemicals. Chronic illnesses include sensitization, lung and liver damage, and cancer.

Effects of Exposure (cont.)

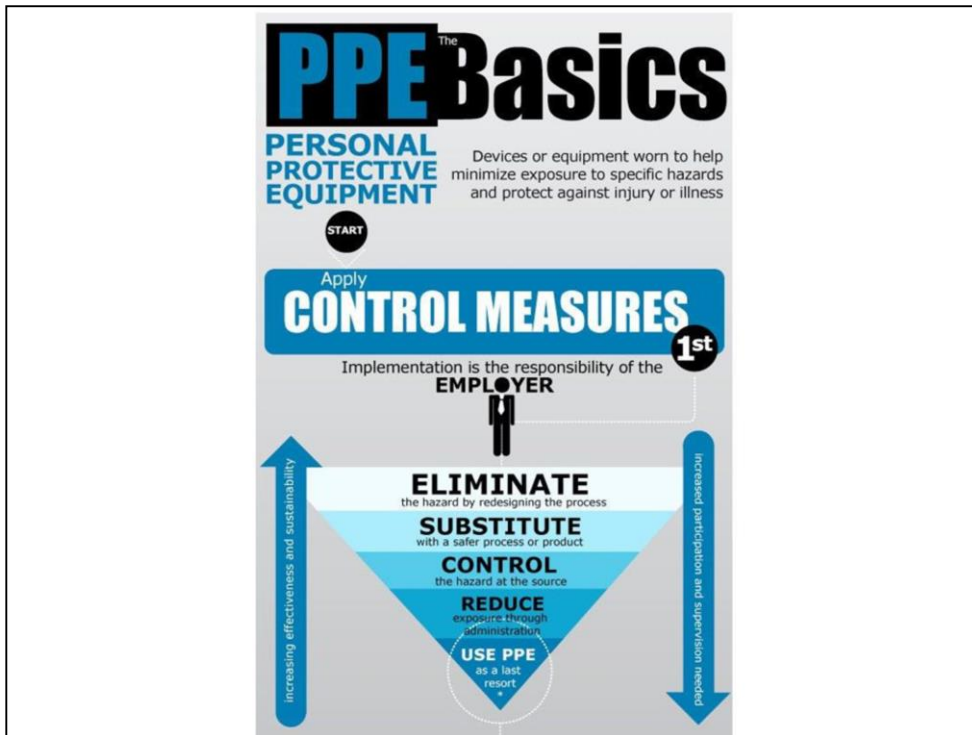
Preventive measures include:



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The concentration and duration of the exposure will often determine how you are affected. Safe exposure limits for many chemicals are set by OSHA and are called the permissible exposure limit, or PEL. Safe concentrations may also be referred to as the threshold limit value, or TLV. Both the TLV and PEL can be found in the SDS. They refer to concentrations of a chemical that the average employee can safely be exposed to during an 8-hour workday.

PELs are legal limits, meaning OSHA can enforce their use and any non-compliance. TLVs are recommendations and not legal limits.



The goal is to keep the concentration level of chemicals in the air below the PEL and TLV to protect you from overexposure.

We use a variety of preventive measures to do this, including:

- **Eliminate** the hazard through engineering controls, such as ventilation or **substitution**;
- **Reduce** exposure through administrative controls, such as limiting the amount of time you can work with certain chemicals or the area where these chemicals are being used; *and*
- As a last resort, **PPE**, such as respirators, gloves, and goggles.



PPE is a very important part of exposure prevention. Sometimes, engineering and administrative controls **alone** aren't enough to prevent exposures. That's where PPE comes in. It's **your** personal barrier against chemical hazards. The type of PPE required depends on the potential exposure. The SDS will identify the right PPE for you.

- Safety glasses should be worn whenever you are working around chemicals, even if you're just moving boxes off a shelf. Goggles offer better protection than safety glasses and should definitely be worn when there's a risk of splashes, vapors, gases, or mists.
- Face shields worn over eye protection—never in place of eye protection—protect your face from splashes or sprays.
- Respirators should be worn to protect against vapors, gases, dusts, or fumes. The type of respirator used depends on the type of chemical as well as the airborne concentration. Very high concentrations of almost any hazardous chemical will require the use of an air-supplied respirator. For lower concentrations, you can generally rely on an air-purifying respirator. The SDS will identify which type of respirator you need and which type of cartridge to use for an air-purifying respirator.

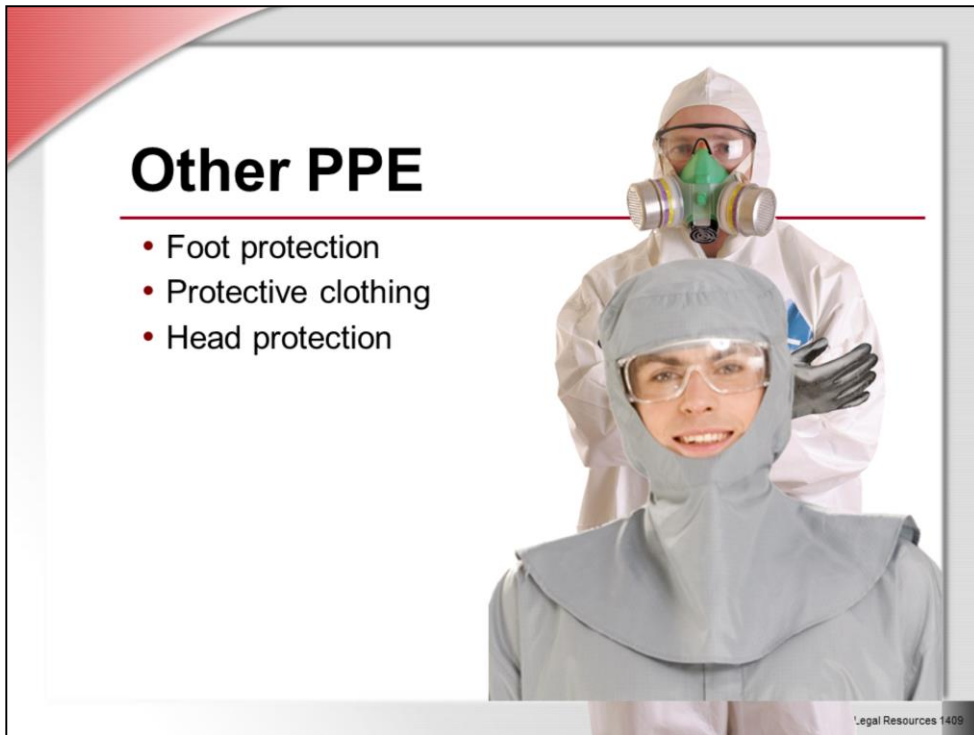


Gloves are also required when handling chemicals. The type of glove you need also depends on the hazard.

For example:

- Butyl gloves work well for ketones, esters, alcohol, and most inorganic acids and caustics.
- Latex can be used for a variety of chemicals, including most acids and caustics, salts, detergents, and alcohols. Many solvents, however, will break down latex.
- Neoprene has good protective qualities against oils, acids, caustics, and some solvents.
- Other types of gloves include nitrile, polyvinyl chloride-coated gloves, polyvinyl alcohol gloves, Viton®, and silver shield gloves, which resist permeation and breakthrough by more chemicals than any other gloves.

Each type of glove has its own special uses. The SDS will identify the best gloves to protect against specific hazards.




- In addition to protecting your eyes and hands, you may also need to protect your feet. Boots are made of many of the same materials as gloves, and protect feet against splashes and sprays.
- Protective clothing also comes in many forms. Paper-like chemicals such as Tyvec[®], protect against dust but not splashes. Some suits can be purchased with different coatings to protect against different types and concentrations of chemicals. Rain suits made of rubber or PVC can protect you from a variety of liquids.
- Head protection generally comes in the form of a hood. The hood will usually be made of the same material as the protective clothing you wear. In fact, many styles of protective clothing come with hoods.



Remember to **think** about the type of PPE you need to protect against the hazards of the chemicals you are working with. You can wear all kinds of various PPE, but if you are not using the **right type**, or if you use it **incorrectly**, it will **not be effective**.

What's on a Chemical Label?

SAMPLE LABEL

| | |
|---|---|
| <p>PRODUCT IDENTIFIER</p> <p>CODE _____ Product Name _____</p> <p>SUPPLIER IDENTIFICATION</p> <p>Company Name _____ Street Address _____ City _____ State _____ Postal Code _____ Country _____ Emergency Phone Number _____</p> <p>PRECAUTIONARY STATEMENTS</p> <p>Keep container tightly closed. Store in cool, well ventilated place that is locked. Keep away from heat/sparks/open flame. No smoking. Only use non-sparking tools. Use explosion-proof electrical equipment. Take precautionary measure against static discharge. Ground and bond container and receiving equipment. Do not breathe vapors. Wear Protective gloves. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.</p> | <p>HAZARD PICTOGRAMS</p>  <p>SIGNAL WORD Danger</p> <p>HAZARD STATEMENT Highly flammable liquid and vapor. May cause liver and kidney damage.</p> <p>SUPPLEMENTAL INFORMATION</p> <p>Directions for use _____ _____</p> <p>Fill weight: _____ Lot Number _____</p> <p>Gross weight: _____ Fill Date: _____ Expiration Date: _____</p> |
|---|---|

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As of June 1, 2016, facilities that use hazardous chemicals must have labels containing the information **and** pictograms required by the Globally Harmonized System of Classification and Labeling of Chemicals, or GHS.

The Global Harmonized System is a system of classification and labeling for chemicals. This system is agreed upon internationally so as to provide consistency and regulation within the classification and labeling of chemicals.

What's on a Chemical Label?

(cont.)

SAMPLE LABEL

| | |
|--|---|
| <p style="text-align: center;">PRODUCT IDENTIFIER</p> CODE _____ Product Name _____ | <p style="text-align: center;">HAZARD PICTOGRAMS</p>  |
| <p style="text-align: center;">SUPPLIER IDENTIFICATION</p> Company Name _____ Street Address _____ City _____ State _____ Postal Code _____ Country _____ Emergency Phone Number _____ | <p style="text-align: center;">SIGNAL WORD</p> Warning |
| <p style="text-align: center;">PRECAUTIONARY STATEMENTS</p> Keep container tightly closed. Store in cool, well ventilated place that is locked. Keep away from heat/sparks/open flame. No smoking. Only use non-sparking tools. Use explosion-proof electrical equipment. Take precautionary measure against static discharge. Ground and bond container and receiving equipment. Do not breathe vapors. Wear Protective gloves. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. | <p style="text-align: center;">HAZARD STATEMENT</p> Highly flammable liquid and vapor. May cause liver and kidney damage. |
| | <p style="text-align: center;">SUPPLEMENTAL INFORMATION</p> Directions for use _____ _____ Fill weight: _____ Lot Number _____ Gross weight: _____ Fill Date: _____ Expiration Date: _____ |

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The chemical label must contain both a product identifier for the chemical **and** supplier identification information.

- The **product identifier** is the name or number that allows you to identify the chemical in the container.
- **Supplier identification** must include the name, address, and telephone number for the chemical manufacturer, importer, or other supplier.
- The chemical label will include one of two **signal words** that tell you the relative severity of the hazard presented. It alerts you to a potential hazard.
 - “Danger” is used for the more severe hazards.
 - “Warning” is used for less severe hazards and is less serious than “Danger.”

What's on a Chemical Label?

(cont.)

Postal Code _____ Country _____
Emergency Phone Number _____

PRECAUTIONARY STATEMENTS

Keep container tightly closed. Store in cool, well ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measure against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear Protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon dioxide (CO₂) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water.

HAZARD STATEMENT

**Highly flammable liquid and vapor.
May cause liver and kidney damage.**

SUPPLEMENTAL INFORMATION

Directions for use

Fill weight: _____ Lot Number _____

Gross weight: _____ Fill Date: _____
Expiration Date: _____

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- **Hazard statements** assigned to a hazard class or category appear on the label. They describe the nature of the hazard and the degree of the hazard. The hazard statement can include information on an exposure being fatal or toxic, organ damage, and routes of exposure. For example, a hazard statement could say:
 - **Highly flammable liquid and vapor. May cause liver and kidney damage.**

- **Precautionary statements** describe recommended measures that should be taken to minimize or prevent adverse effects from exposure to a chemical or improper storage or handling. Four types of precautionary statements appear on a chemical label. They are:
 1. Prevention. For example, “Wash thoroughly after handling.”
 2. Response. For example, “If swallowed, immediately call a poison center.”
 3. Storage. For example, “Store locked up.”
 4. Disposal. For example, “Dispose of in accordance with local, regional, national, and international regulations, as specified.”

What's on a Chemical Label?


(cont.)

- Pictograms
- Symbols
- Supplemental Information

SAMPLE LABEL

PRODUCT IDENTIFIER
CODE _____
Product Name _____

SUPPLIER IDENTIFICATION
Company Name _____
Street Address _____
City _____ State _____
Postal Code _____ Country _____
Emergency Phone Number _____

HAZARD PICTOGRAMS


SIGNAL WORD
Danger

HAZARD STATEMENT
Highly flammable liquid and vapor.
May cause liver and kidney damage.


PRECAUTIONARY STATEMENTS
Keep container tightly closed. Store in cool, well ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measure against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear protective gloves.
Do not eat, drink or smoke when using.
Do not get in eyes, on clothing, or on skin.
Clean immediately in accordance with local, regional, national, or international regulations as specified.

SUPPLEMENTAL INFORMATION
Directions for use

Fill weight: _____ Lot Number _____
Gross weight: _____ Fill Date: _____
Expiration Date: _____



In Case of fire: use dry chemical (BC) or Carbon Dioxide (CO₂) fire extinguishers.

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- Pictograms include a symbol and other graphic elements intended to convey specific information about the hazards of a chemical. They appear on a white background within a diamond-shaped square with a red border **and** are placed on the label based on a chemical's hazard classification.
- There are eight mandatory hazard symbols used in pictograms. Each conveys the specific hazard of the chemical, with a ninth non-mandatory symbol for environmental hazards.
- Supplemental information includes any additional information provided on the chemical label that is not required or specified by the GHS amendments to HazCom.

HCS Pictograms and Hazards

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

Secondary Containers

- **Employers** must ensure labels are present on containers
- **Employees** must label portable/secondary containers if used for more than their shift or if not going to be used right away

Secondary Containers

Labeling Requirements for Secondary Containers

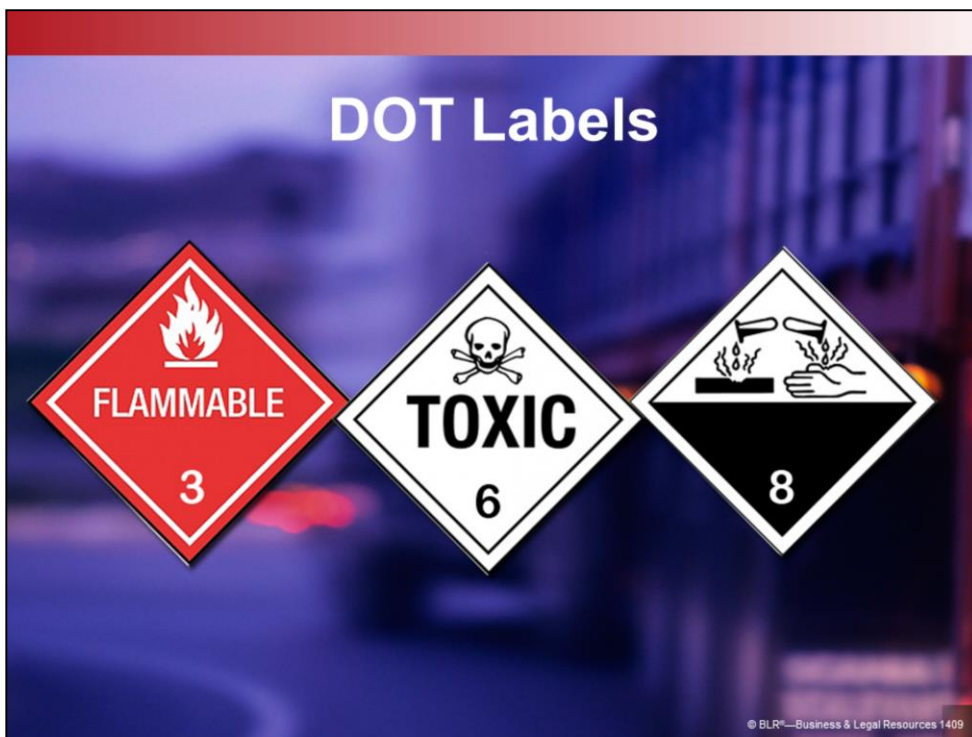
Chemical Name
GHS Signal Words
GHS Hazard Statements
Precautionary Statements
GHS Pictograms

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Labels on secondary containers must meet the GHS requirements.

They must contain:

- 1) Chemical Name
- 2) GHS signal words
- 3) GHS hazard statements
- 4) Precautionary statements, and
- 5) GHS pictograms



Here are some examples of Department of Transportation labels. DOT labels are effective because they visually tell you about the hazard or danger associated with a hazardous chemical.

- The DOT flammable label is the one with the red background with the white flame. The number 3 at the bottom is the DOT hazard identification number, which means this is a flammable liquid. Flammable gases and solids also have the flame, but the colors vary and the numbers are different. A flammable solid has the number 4 on the label, and a flammable gas has the number 2.
- The DOT poison label is the one with the skull and crossbones. This means the chemical is toxic to humans, animals, or the environment. The number at the bottom of a poison label is 6.
- The DOT corrosive label is very descriptive. The upper half has two pictures. One shows a chemical dripping on a steel bar and eating a hole in the metal. The other shows the chemical burning a hand. The number at the bottom of the label is 8, for corrosive chemicals.

Hazardous Materials Warning Placards

Actual placard size: at least 273 mm (10.8 inches) on all sides

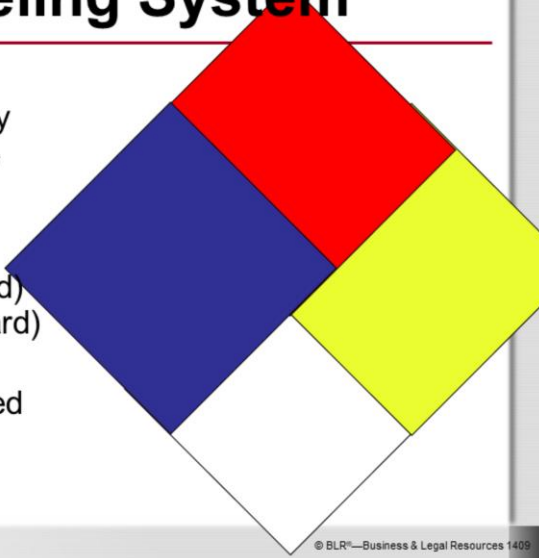
| CLASS 1 Explosives | CLASS 2 Gases | CLASS 3 Flammable Liquid and Combustible Liquid | CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet | | |
|---|---|---|--|--|--|
| <p> \$172.527 \$172.523 \$172.524 \$172.525 </p> <p><small>* For Division 1.1, 1.2, or 1.3, enter division number and compatibility group letter, when required; placard any quantity. For Divisions 1.4, 1.5, and 1.6, enter compatibility group letter, when required; placard 454 kg (1,001 lbs) or more.</small></p> | <p> \$172.528 \$172.530 \$172.532 \$172.540 </p> <p><small>For NON-FLAMMABLE GAS, OXYGEN (compressed gas or refrigerated liquid), and FLAMMABLE GAS, placard 454 kg (1,001 lbs) or more gross weight. For POISON GAS (Division 2.3), placard any quantity.</small></p> | <p> \$172.542 \$172.544 </p> <p><small>For FLAMMABLE, placard 454 kg (1,001 lbs) or more. GASOLINE may be used in place of FLAMMABLE placard displayed on a cargo tank or portable tank transporting gasoline by highway. Placard combustible liquid transported in bulk. See \$172.504(6)(2) for use of FLAMMABLE placard in place of COMBUSTIBLE. FUEL OIL may be used in place of COMBUSTIBLE on a cargo or portable tank transporting fuel oil not classed as a flammable liquid by highway.</small></p> | <p> \$172.546, \$172.547, \$172.548 </p> <p><small>For FLAMMABLE SOLID and SPONTANEOUSLY COMBUSTIBLE, placard 454 kg (1,001 lbs) or more. For DANGEROUS WHEN WET (Division 4.2), placard any quantity.</small></p> | | |
| <p> \$172.550, \$172.552 </p> <p><small>Organic Peroxides, Transition 2011 (not used, and sunset) 2014 (highway)</small></p> <p><small>For OXIDIZER and ORGANIC PEROXIDE letter have TWY 8, temperature controlled; placard 454 kg (1,001 lbs) or more. For ORGANIC PEROXIDE (Division 5.2), TWY 8, temperature controlled; placard any quantity.</small></p> | <p> \$172.504B(10), \$172.524, \$172.555 </p> <p><small>For POISON (PG I or PG II, other than inhalation hazard) and POISON (PG III), placard 454 kg (1,001 lbs) or more. For POISON-INHALATION HAZARD (Division 6.2), inhalation hazard only; placard any quantity.</small></p> | <p> \$172.556 </p> <p><small>Placard any quantity - packages bearing RADIOACTIVE YELLOW III labels only. Contains low specific activity radioactive materials in "exclusive use" will not bear the label, but the radioactive placard is required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with \$172.504(d) Table 1 and \$172.407(8)(b).</small></p> | <p> \$172.558 </p> <p><small>For CORROSIVE, placard 454 kg (1,001 lbs) or more.</small></p> | <p> \$172.560 </p> <p><small>Not required for domestic transportation. A bulk packaging containing a Class 9 material must be marked with the appropriate ID number displayed on a Class 9 placard, on cargo panel, or a white square-on-point display in Table 2 must be applied.</small></p> | <p> \$172.531 </p> <p><small>A freight container, and load device, transport vehicle, or rail car which contains non-bulk packages with two or more categories of hazardous materials that require different placards specified in Table 2 may be placarded with DANGEROUS placard instead of the specific placards required for each of the materials in Table 2. However, when 1,000 kg (2,205 lbs) or more of one category of material is loaded at one loading facility, the placard specified in Table 2 must be applied.</small></p> |
| <p> \$172.527 </p> <p><small>White square background required for placard for highway mode controlled quantity radioactive material and for rail shipment of certain explosives and poisons, and for flammable gas in a DOT 113 tank car (\$172.507 and \$172.516).</small></p> | <p> \$172.532 </p> <p><small>Appropriate placard must be used.</small></p> | <h3 style="margin: 0;">IDENTIFICATION NUMBER DISPLAYS</h3> <p><small>MUST BE DISPLAYED ON: (1) Tank Cars, Cargo Tanks, Portable Tanks, and other Bulk Packagings; (2) Vehicles or containers containing 4,000 kg (8,820 lbs) in non-bulk packages of only a single hazardous material having the same proper shipping name and identification number; and (3) 1,000 kg (2,205 lbs) of material packaged by inhalation in Hazard Zone A or B. See \$172.301(a)(2) and \$172.313(c).</small></p> | | | |

Response begins with identification!

It is important to understand how to interpret DOT placards and labels. You will see them on the vehicle delivering hazardous materials **and** on the outside of boxes. They are your first clue on how to properly handle the material.

NFPA Labeling System

- Blue = Health
- Red = Flammability
- Yellow = Instability
- White = Other hazards/handling
- Scale: 0 (no hazard) to 4 (extreme hazard)
- GHS labels are opposite those used under NFPA



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The National Fire Protection Association, or NFPA, has developed a labeling system that uses colors and numbers to warn about material hazards. The labels are typically in the shape of a larger diamond enclosing four different colored diamonds. The colors tell you the type of hazard.

- Blue represents health hazards;
- Red represents flammability hazards;
- Yellow represents instability or reactivity hazards;
- White represents other hazards or special handling recommendations;
- NFPA labels also display numbers ranging from 0, for no hazard, to 4, for extremely hazardous.

Note that the GHS system works in the opposite way. GHS has hazard numbers ranging from 1 to 4, with 1 being the most hazardous and 4 being the least hazardous. Under GHS there is no 0 (zero). Remember this to avoid confusion.

Safety Data Sheets

Read the SDS before working with any hazardous chemical.



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Labels give you a snapshot of the risks associated with a chemical. The safety data sheet (SDS) gives you the most complete and detailed information.

The SDS for each chemical:

- Is a detailed written description of the chemical;
- Describes its hazards, as well as precautions and remedies to releases and exposure; *and*
- Must be readily available for you to read.

You should always read the SDS before starting to work with a chemical.

Safety Data Sheet Components

| | |
|---|---|
| Section 1 Identification | Section 9 Physical & chemical properties |
| Section 2 Hazard(s) identification. | Section 10 Stability and reactivity |
| Section 3 Composition/information on ingredients | Section 11 Toxicological information |
| Section 4 First-aid measures | Section 12 Ecological information* |
| Section 5 Fire-fighting measures | Section 13 Disposal considerations* |
| Section 6 Accidental release measures | Section 14 Transport information* |
| Section 7 Handling & Storage | Section 15 Regulatory information* |
| Section 8 Exposure controls/personal protection | Section 16 Other information |

*Sections 12-15 are non-mandatory



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As of June 1, 2015, the Hazard Communication standard requires new SDSs to be in a uniform format and include section numbers, headings and specific information.

Sections 1–4

SAFETY DATA SHEET

| Hazard Statements | | Precautionary Statements | | |
|---|---|--|----------------------------------|------------------------------|
| H320: Causes eye irritation | | P210: Keep away from heat/sparks/open flames/hot surfaces - No smoking | | |
| Section 1: Chemical and Supplier Information | | | | |
| H351: Suspected of causing cancer | | | | |
| Section 3: Composition and Information on Ingredients | | | | |
| | CAS# | EINECS# | REACH Pre-registration Number | CONCENTRATION % by Weight |
| Methylene Chloride* (dichloromethane) | 75-09-2 | 200-838-9 | Under development | 75-90 |
| Trichloroethylene* | 79-01-6 | 201-167-4 | Under development | 5-15 |
| Section 2: Hazards Identification | | | | |
| All of the constituents of this adhesive product are listed on the TSCA inventory of chemical substances maintained by the US EPA, or are exempt from that listing. | | | | |
| *Indicates this chemical is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372) | | | | |
| Section 4: First Aid Measures | | | | |
| Contact with eyes: | Flush eyes immediately with plenty of water for 15 minutes and seek medical advice immediately. | | | |
| Skin contact: | Wash skin with soap and water. If irritation develops, get medical attention. | | | |
| Inhalation: | Remove to fresh air. If breathing is stopped, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice. | | | |
| Ingestion: | Do not induce vomiting. Seek medical advice immediately. | | | |

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- **Section 1** contains the product identifier and other means of identification, recommended uses and restrictions, supplier information, and an emergency number.
- **Section 2** contains the hazard classification, the signal word, hazard and precautionary statements, hazard symbol, other hazards not otherwise classified, and any statements regarding mixtures consisting of ingredients of unknown toxicity.
- **Section 3** contains information about chemical composition and ingredients, including chemical name, common name and synonyms, CAS number and other unique identifiers.
- **Section 4** contains a description of necessary first aid, symptoms and health effects (acute and delayed), and the need for immediate medical attention and special treatment (if required).

Sections 5–8

Section 5: Fire-Fighting Measures

| | | | | | |
|--|---|--------------|---|---|-----------------------|
| Suitable Extinguishing Media: | Water fog or fine spray, carbon dioxide, dry chemical or foam. | Health | 2 | 2 | 1-Slight |
| Unsuitable Extinguishing Media: | Dry chemical powder. | Flammability | 1 | 1 | 2-Moderate |
| Exposure Hazards: | Inhalation and dermal contact. | Reactivity | 0 | 0 | 3-Serious 4-Severe |
| Combustion Products: | Hydrogen chloride, trace amounts of chlorine, phosgene. | | | | |
| Protection for Firefighters: | Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing. | | | | |

Section 6: Accidental Releases Measures

| | |
|---|---|
| Personal Precautions: | Clear all personnel from area. Do not breathe vapors. Ventilate area of leak or spill. Wear protective equipment, positive pressure self contained or air supplied breathing apparatus. Follow confined space entry procedures. |
| Environmental Precautions: | Prevent product or liquids contaminated with product from entering sewers, drains, soil or open water course. |
| Methods for Cleaning up: | Mop or soak up immediately. Place in properly labeled metal containers. |
| Materials not to be used for clean up: | Zinc, Aluminum, or plastic containers. |

Section 7: Handling and Storage

| | |
|------------------|---|
| Handling: | Avoid breathing of vapor, avoid contact with eyes, skin and clothing Do not swallow. Use with adequate ventilation. Do not cut, drill grind, weld or perform similar operations on or near empty containers. Vapors of this product are heavier than air and will collect in low areas. |
| Storage: | Do not eat, drink or smoke while handling. Store in a dry place. Keep container tightly closed when not in use. Significant vapor pressures (>5psi) can be |

Section 8: Exposure Controls and PPE

| Component | ACGIH TLV | ACGIH STEL | OSHA PEL | OSHA STEL |
|---|-----------|------------|----------|-----------|
| Methylene chloride (dichloromethane) | 50 ppm | N/E | 25 ppm | 125 |
| Trichloroethylene | 50 ppm | 100 ppm | 100 ppm | N/E |
| Methyl Methacrylate Monomer, Stabilized (MMA) | 50 ppm | 100 ppm | 100 ppm | N/E |

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- **Section 5** contains information about suitable and unsuitable extinguishing substances, and about specific hazards from the chemical, and special PPE and precautions for firefighters.
- **Section 6** contains information about personal precautions and PPE, emergency precautions, environmental procedures, and containment and cleanup methods and materials.
- **Section 7** describes precautions for safe handling and conditions for safe storage.
- **Section 8** contains information about control parameters, engineering controls, and individual protection measures and PPE.

Sections 9–10

Section 9: Physical and Chemical Properties

| | | | |
|--|---|-----------------------------|--|
| Appearance: | Clear thin liquid | Odor Threshold: | 250 ppm (Methylene Chloride) |
| Odor: | Irritating | Evaporation Rate: | >1.0 (BUAC=1) |
| pH: | Not Applicable | Flammability: | None |
| Melting/Freezing Point: | -96.7°C (-142.1°F) Methylene Chloride | Flammability Limits: | LEL: 14% (Methylene Chloride) UEL: 22% (Methylene Chloride) |
| Boiling Point: | 39.8°C (104°F) Based on first boiling component: Methylene Chloride | Vapor Pressure: | 355 mmHG @ 20C (Methylene Chloride) |
| Flash Point: | None (Methylene Chloride) | Vapor Density: | >2.0 (Air = 1) |
| Specific Gravity: | 1.32 @23°C (73.4°F) | Other Data: | Viscosity: Water-thin |
| Solubility: | 1.3 @ 25°C (Methylene Chloride) | | |
| Partition coefficient n-octano/water: | Not Available | | |
| Auto-ignition Temperature: | 556°C (1033°F) (Methylene Chloride) | | |
| Decomposition Temperature: | Not Applicable | | |
| VOC Content: | When applied as directed, per SCAFQMD Rule 1168, Test Method 316A, VOC content is <250 g/l. | | |

Section 10: Stability and Reactivity

| | |
|--|--|
| Stability: | Stable under recommended storage conditions. (See Section 7) |
| Hazardous decomposition products: | Depending on temperature and air supply, may include hydrogen chloride, trace amounts of chlorine, phosgene. |
| Conditions to avoid: | Avoid open flames, welding arcs, or other high temperature sources. Avoid direct sunlight. |
| Incompatible Materials: | Oxidizers strong bases, amines, metals such as zinc powders aluminum or magnesium powders, potassium sodium. |

SECTION 11-TOXICOLOGICAL INFORMATION

1. Likely Routes of Exposure: Inhalation, Eye and Skin contact

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- **Section 9** contains information about the substance's physical and chemical properties, **such as** appearance, odor, melting and freezing points, flash point, and flammability.
- **Section 10** contains information about the substance's stability or reactivity, possible hazardous reactions, conditions to avoid and incompatible chemicals.

Sections 11–12

Section 11: Toxicological Information

| | | | | | |
|--|--|---------------------|------------------------------------|---------------------------------|-----------------------------|
| Likely Routes of Exposure: | Inhalation, Eye and Skin contact | | | | |
| Acute symptoms and effects: | Excessive overexposure may cause irritation to nose and throat. In confined areas, vapor can accumulate and can cause unconsciousness. | | | | |
| Inhalation: | May cause moderate eye irritation which may be slow to heal. May cause slight corneal injury. Vapor may cause mild discomfort and redness. | | | | |
| Eye Contact: | Prolonged contact may cause skin burns. May cause more severe response on covered skin (under clothing and gloves). | | | | |
| Skin Contact: | Low toxicity if small amount swallowed, however larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting. | | | | |
| Ingestion: | IARC Classification 2B (Methylene Chloride) | | | | |
| Chronic (long term) effects: | IARC Classification 2B (Methylene Chloride) | | | | |
| Toxicity: | LD 50 | | LC50 | | |
| Methylene Chloride (dichloromethane) | Oral: 1500-2500 mg/kg (rat), Dermal: Not Determined | | Inhalation 7 hrs. >10000 PPM (rat) | | |
| Trichloroethylene | Oral: 5650 mg/kg (rat) | | Inhalation 4 hrs. 12000PPM (rat) | | |
| Methyl Methacrylate Monomer, Stabilized (MMA) | Oral: 7900 mg/kg (rat), dermal: >35000 mg/kg (rabbit) | | Inhalation: 3hrs. 7093 PPM (rat) | | |
| Reproductive Effects | Teratogenicity | Mutagenicity | Embryotoxicity | Sensitization to Product | Synergistic Products |
| Not Established | Not Established | Not Established | Not Established | Not Established | Not Established |

Section 12: Ecological Information

| | |
|-------------------------|--|
| Ecotoxicity: | None Known |
| Mobility: | In normal use, emission of volatile organic compounds (VOC's) to the air takes place, typically at a rate of <250 g/l. Mobility in soil is high. |
| Degradability: | Not readily biodegradable |
| Bioaccumulation: | Low |

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- **Section 11** contains information describing likely routes of exposure, symptoms, immediate and delayed health effects and numerical measures of toxicity.
- **Section 12** contains ecological information such as the substance's ecotoxicity, persistence and degradability, bioaccumulative potential, mobility in soil, and other adverse environmental effects.

Sections 13–14

Section 13: Disposal Considerations

Chemical residues are generally classified as hazardous waste, and as such are covered by regulations which vary according to location. Contact your local waste disposal authority for advice, or pass to a licensed chemical disposal company. Rinse out empty containers thoroughly before returning for recycling. Washing liquid should not be allowed to enter drains but be disposed of as hazardous waste.

When recovery and recycling is not possible, incineration in a high-temperature incinerator is the recommended method of disposal.

Do not allow to enter drinking water supplies, waste water, or soil.

Section 14: Transportation Information

Proper Shipping Name: Dichloromethane (Mixture)
Hazard Class: 6.1
Secondary Risk: None
Identification Number: UN 1593
Packing Group: PG III
Label Required: Toxic (Domestic USA and International)
Marine Pollutant: NO

EXCEPTION for Ground Shipping

DOT Limited Quantity: Up to 4L per inner packaging, 30 kg gross weight per package.
Consumer Commodity: Depending on packaging, these quantities may qualify under DOT as "ORM-D"

TDG INFORMATION

| | |
|-------------------------|---------------------------|
| TDG CLASS: | Toxic 6.0 |
| SHIPPING NAME: | Dichloromethane (Mixture) |
| UN NUMBER/PACKING GROUP | UN 1593 PGIII |

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- **Section 13** provides information on waste residues and safe handling and disposal of substances and contaminated packaging.
- **Section 14** gives information on the safe transportation of the chemical.

Sections 15–16

Section 15: Regulatory Information

Precautionary Label Information: Harmful, Suspected Carcinogen Ingredient Listings: USA TSCA Europe EINECS, Canada DSL, Australia AICS, Korea, ECL/TCCL, Japan MITI (ENS), **CA Prop 65**

Symbols: Xn

Risk Phrases: R23/34/35: Toxic by inhalation, in contact with skin and if swallowed
R36/37: Irritating to eyes and respiratory system.
R40: Possible risks of irreversible effects.
R66: Repeated exposure may cause skin dryness or cracking
R67: Vapors may cause drowsiness and dizziness

Safety Phrases: S2: Keep out of the reach of children.
S7: Keep container tightly closed when not in use
S9: Keep container in a well-ventilated place.
S16: Keep away from sources of ignition No smoking.
S23/24/25: Avoid breathing vapors, contact with skin and eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S29: Do not empty into drains.
S33: Take precautionary measures against static discharges.
S51: Use only in well ventilated areas.

Section 16: Other Information

Specification Information:

Department issuing data sheet: IPS.Safety Health & Environmental Affairs All ingredients are compliant with the requirements of the European Directive on ROHS (Restriction of Hazardous Substances).

Email address: EHSinfo@ipscorp.com

Training necessary: Yes training in practices and procedures contained in product literature.

Reissue date / reason for reissue: 2/19/2010 / Modified GHS Standard Format

Intended Use of Product: Solvent Cement for Bonding Acrylics

This product is intended for use by skilled individuals at their own risk. The information contained herein is based on data considered accurate based on current state of knowledge and experience. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from its use. © 2010 IPS Safety & Legal Resources 1409

- **Section 15** contains safety, health, and environmental regulatory information.
- **Section 16** provides other relevant information.

Safety Data Sheet Components

| | |
|---|---|
| Section 1 Identification | Section 9 Physical & chemical properties |
| Section 2 Hazard(s) identification. | Section 10 Stability and reactivity |
| Section 3 Composition/information on ingredients | Section 11 Toxicological information |
| Section 4 First-aid measures | Section 12 Ecological information* |
| Section 5 Fire-fighting measures | Section 13 Disposal considerations* |
| Section 6 Accidental release measures | Section 14 Transport information* |
| Section 7 Handling & Storage | Section 15 Regulatory information* |
| Section 8 Exposure controls/personal protection | Section 16 Other information |

*Sections 12-15 are non-mandatory



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It's essential for you to be able to find safety and health information about the hazardous chemicals you work with and to know how to respond effectively in emergencies involving hazardous chemicals.

Emergency Response: First Aid

- Eyes
- Skin
- Inhalation
- Ingestion
- Injection



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It is important always to read the label and SDS for exact first-aid procedures for hazardous chemicals. This slide contains basic procedures that are generally appropriate for most exposures.

- If chemicals **splash in your eyes**, go immediately to an eyewash station, hold your eyelids open, and flush eyes with water for about 15 minutes. Then seek medical attention.
- If you get chemicals **on your skin**, wash immediately with soap and water to remove the chemical and then flush the area well with water to remove all traces of chemical. If you get hazardous chemicals on your work clothes, remove clothes and use a safety shower to wash chemicals off your skin. Then seek medical attention.
- If you **inhale hazardous chemicals**, get away from the area and get into fresh air. If you still feel symptoms, seek medical attention.
- If you **swallow, or ingest, hazardous chemicals**, get medical assistance immediately. First aid procedures for ingestion vary, so you have to check the SDS.
- If hazardous chemicals get **under your skin**, wash the area, and seek medical attention right away.

If you do suffer an exposure, make sure you report it to your supervisor. As with any injury, if complications arise after the exposure and you did not report the injury, you will not be covered by workers compensation.

Emergency Response: Spills and Leaks


- Evacuate
- Notify
- Remove ignition sources
- Stay away

- Unless you are a member of an emergency spill response team, you should evacuate the immediate area of a spill and notify others right away.
- Tell coworkers in the area to evacuate, notify a supervisor, and call the emergency response coordinator or 911.
- If it is safe to do so, remove ignition sources. For example, if a drum of flammable liquid is leaking or spilled, you should turn off motors and machines as well as electrical power boxes in the area to prevent a spark from ignited vapors.
- Once you've safely evacuated, stay out of the area until you are told that it is safe to return.

Review

Do you understand:

- Labels?
- SDSs?
- First aid for exposures?
- Spill response?



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Now is the time to ask questions about what we've discussed. Do you have any questions about:

- Labels?
- SDSs?
- First aid for exposures?
- Spill response?

Where is the written plan located?

Where are your SDS sheets located?

Where is your spill kit located?

If you have any questions about the Hazard Communication Program contact the Environmental Health and Safety Department at 815-753-0404.

KEY POINTS To Remember!

- The Hazard Communication standard requires that you are protected against hazards.
- Know the hazards of the chemicals you handle.
- Always read labels and SDSs, and wear appropriate PPE.
- Know the symptoms of exposure and proper first aid for exposure.
- Follow proper procedures for responding to spills and leaks.

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Here are the main points to remember from this Hazard Communication refresher course:

- The Hazard Communication standard requires employees and employers to work together to identify and protect against hazards.
- Inform yourself about the hazards of the chemicals you handle and the required safe work practices. While you have a right-to-know about the hazards of chemicals in your work area, you also have an obligation to make sure you fully understand such hazards.
- Always read labels and SDSs, and wear appropriate PPE.
- Know the symptoms of exposure and proper first aid for the chemicals you work with and around.
- Follow proper procedures for responding to spills and leaks.