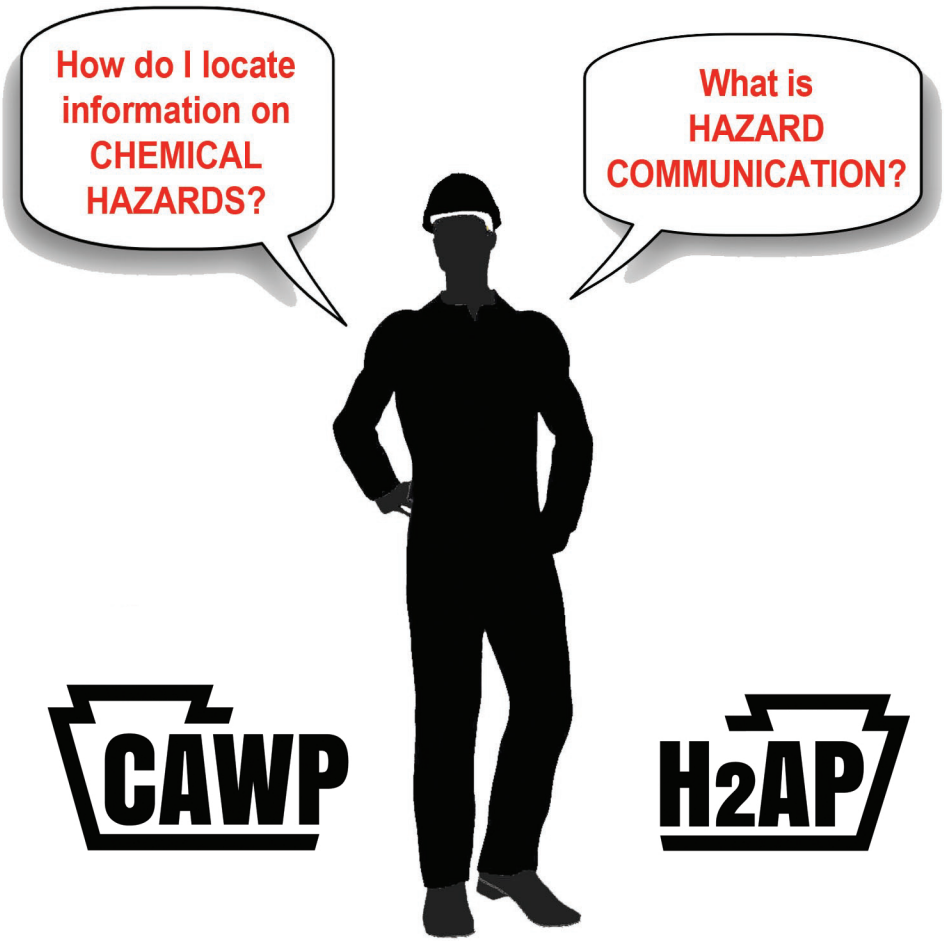
Hazard Communication

Employee Training Booklet



HAZARD COMMUNICATION
EMPLOYEE TRAINING BOOKLET

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The Hazard Communication Employee Training Booklet has been developed to aid employers, supervisors and employees in their efforts toward achieving voluntary compliance with the OSHA standard.

This booklet is not intended to be comprehensive of all matters pertaining to the OSHA Hazard Communication Standard or its implementation. It is not to be considered legal advice or any assurance that future regulations and/or court and administrative rulings will not vary from the material contained herein.

If you have any specific questions concerning these regulations, their implementation or enforcement, you should consult your supervisor.

Section 1: Introduction

Chemicals are a part of your everyday life. They are also a part of your job even though you may not think of the supplies and materials you use as chemicals. While each chemical has a necessary function, it also may have hazards. Recognizing the hazard and then controlling it is the key to safety.

After completing this booklet you will be able to:

1. Understand how Hazard Communication works.
2. Find the six parts of a chemical label; know how these six parts work together, and be able to use a label at work.
3. Understand the order of information on the Safety Data Sheet (SDS) and how to obtain and use the hazard information.
4. Know how the information on the label is related to the SDS.
5. Understand how chemicals are grouped based on the type of hazard; i.e., flammables are physical hazards.
6. Describe several methods to control chemical exposures by using the safe handling methods and by wearing Personal Protective Equipment (PPE).
7. Describe the four ways that chemicals can enter the body.
8. Recognize the ways to detect a chemical overexposure.
9. Take action if you or others are overexposed to hazardous chemicals.

As your employer, we are required by OSHA to inform you of:

1. The requirements of the OSHA Hazard Communication Standard, 1926.59 (which is identical to 1910.1200).
2. The location of the company written hazard communication program, list of chemicals, and Safety Data Sheets (SDS).
3. Details about the company hazard communication program, such as specific workplace labeling systems.
4. Specific procedures to protect employees from hazardous chemicals, such as work practices, emergency procedures, and PPE to be used.
5. Operations where hazardous chemicals are present.
6. Hazardous chemicals introduced by another employer.
7. The dangers of a new chemical brought onto the job.
8. How to retrieve a SDS if it will be obtained by electronic means.

Section 2: Hazard Communication

The foundation of hazard communication is knowledge and understanding. We use thousands of chemical throughout our lives, at home and at work, but most of us would be hard-pressed to distinguish safe products from hazardous ones without information and training.

As children, we learned to recognize that symbols like Mr. Yuk mean we should NOT eat or drink things from under the kitchen sink. Later, we learned that a skull and crossbones means that a product is toxic or deadly.

OSHA's Hazard Communication Standard (HCS) was developed to require employers to train their employees to recognize chemical hazards – using the information on product labels and in safety data sheets – and to take the necessary precautions to protect themselves.

Hazard Communication in the Workplace

An effective hazard communication program ensures that workers who may be exposed to hazardous chemicals know about the chemical hazards and understand how to protect themselves from the hazards.

Product labels and safety data sheets (SDS), formerly known as material safety data sheets (MSDS), are the main tools for developing a hazard communication program. They identify the hazardous properties of chemicals that may pose a health or physical hazard and provide guidance for appropriate protective measures.

Globally Harmonized System (GHS)

In 2012, OSHA revised the Hazard Communication Standard to be consistent with the United Nation's Globally Harmonized System (GHS) of classification and labeling of chemicals. The GHS is an international approach to hazard communication that provides specific criteria for classification of chemical hazards and a standardized approach to label elements and safety data sheets.

Since the US is both a major importer and exporter of chemicals, American workers often see labels and safety data sheets required by other countries. As countries around the world adopt GHS, chemicals crossing borders will have consistent information. This will enhance both employer and worker comprehension of the hazards, and will help to ensure appropriate handling and safe use of chemicals.

Chemical Labels

Container labels are the first and easiest places to look to find out if the material you are using is hazardous. Labels can also tell you quickly what you need to do to protect yourself.

*Chemical Labels that are compliant with GHS must have **six** parts.*

PRODUCT IDENTIFIER ⟸ **PRODUCT IDENTIFIER**

CODE _____
Product Name _____

SUPPLIER IDENTIFICATION ⟸ **SUPPLIER IDENTIFICATION**

Company Name_____
Street Address _____ City _____ State _____
Postal Code _____ Country _____ Emergency Phone Number _____

PRECAUTIONARY STATEMENTS ⟸ **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 (CO_2) fire extinguisher to extinguish.

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

HAZARD PICTOGRAMS  ⟸ **HAZARD PICTOGRAMS**

SIGNAL WORD: **Danger** ⟸ **SIGNAL WORDS**

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

Supplemental Information
Directions for use _____
Fill weight: _____ Lot Number _____ Gross weight: _____ Fill Date: _____
Expiration Date: _____

1. **Product Identifier** – How the hazardous chemical is identified. It gives the chemical name and code or batch number.

2. **Supplier Identification** – Name, address and phone number of the chemical manufacturer, distributor, or importer.

3. **Precautionary Statements** - Give detailed information on how to properly work with the chemical to stay safe. It gives information in four categories.

   - Prevention – how to control the hazards of the chemical.
   - Response – first aid measures, spill cleanup procedures, or the method for dealing with a fire involving the product.
   - Storage – how to store the product safely.
   - Disposal – how to properly dispose of the product and the container.

***Precautionary statements will be the same on the label as on the SDS. When there are similar precautionary statements, the one providing the most protective information will be on the label.*

***Labels can be used to obtain information on proper storage of chemicals and to quickly locate information on first aid.*

4. **Signal Words** - There are two: **WARNING** and **DANGER**. Warning means to be careful, and take all recommended safety precautions. Danger is a more serious word, and it means that it is important to be extremely careful because this product has a higher level of hazards.

5. **Hazard Statement** - Describes what kinds of hazards this chemical has such as its flammability, what may happen if it comes in contact with the body and what effects it can have if it is inhaled.

6. **Pictograms** - There are 9 distinct pictograms that are part of the Hazard Communication Standard. The pictograms are symbols that show what kind of hazards a chemical has. The pictograms will always be a black symbol on a white background with a red diamond-shaped border.

***When a chemical has multiple hazards, different pictograms are used to identify the various hazards.*

PICTOGRAMS

Health Hazard 	**Flammables** 	**Oxidizers** 
Irritant 	**Gases Under Pressure** 	**Explosives** 
Corrosives 	**Environmental Toxicity** 	**Acute Toxicity** 

Follow these rules for labeling:

- Make sure all containers have a proper GHS label.
- If you use workplace labels, make sure that they include the name of the product and information regarding the hazards of the product.
- Replace torn and damaged labels.
- Label smaller workplace containers that have had chemicals transferred into them if they are used during more than one work shift or by more than one employee.

Interpretation of the Safety Data Sheet - Section By Section Analysis

Safety Data Sheets

A Safety Data Sheet is a technical report that explains how to safely use, handle and store a chemical. The GHS has established a standard Safety Data Sheet format. It has 16 sections that must be presented in the same order.

Here is an overview of each section:

Section 1 – Product Identification: This section includes the product name, synonyms or other common names for the product, a short product description and the product type. It also includes what the product is used for and provides the name of the supplier, address and an emergency telephone number.

Section 2 – Hazard Identification: Provides hazard classification, which includes the GHS signal word (Danger or Warning), one or more pictograms and the hazard statements, and also the Precautionary Statements, which include information on Prevention, Response, Storage, Disposal and any other hazards.

Section 3 – Composition and Ingredients: Identifies the ingredients contained in the product. The section will show the Chemical Name, Common Names and Synonyms, CAS Number and other unique identifiers.

Section 4 – First Aid Measures: Lists first aid measures for skin/eye contact, inhalation, and ingestion. Also included are immediate and delayed health effects and information on when to seek medical help.

Section 5 – Fire-fighting Measures: Provides recommendations for fighting a fire involving the chemical. Information includes what to do if there is a fire, how to extinguish, what could happen if the chemical burns and what equipment and special precautions for firefighters.

Section 6 – Accidental Release Measures: Explains what to do if the chemical spills, leaks or is released, how to contain and clean up, what emergency procedures to follow and what experts can help.

Section 7 – Handling and Storage: Describes safe handling processes, protective measures to minimize the risk of the chemical spilling or being released, and recommendations for storing it safely.

Section 8 – Exposure Controls and Personal Protection: Details the permissible exposure limits, what engineering controls need to be taken and what personal protection equipment is required.

Section 9 – Physical and Chemical Properties: Describes the product's physical and chemical properties, including information on the product's appearance, color, odor, and viscosity. Other information included might be the product's flash point, the vapor density, the upper and lower explosive limits, and the pH.

Section 10 - Stability and Reactivity: Tells if the chemical can be unstable and cause reactions. It defines what reactions can be and what conditions to avoid to prevent reactions.

Section 11 - Toxicological Information: Describes what health effects that product exposure can cause. It defines how the product can get into the body and the symptoms and effects of exposure.

Section 12 – Ecological Information: Describes what impact the product can have on the environment (water, air, and soil quality).

Section 13 – Disposal Considerations: Explains safe disposal of the product, ways to recycle or reclaim the chemical, and what to do with used and empty containers.

Section 14 – Transport Information: Explains how to ship and transport the chemical so that it remains stable and properly contained.

Section 15 – Regulatory Information: Lists other regulatory information which may be required that isn't covered in the SDS.

Section 16 – Other Information: Includes abbreviations or acronyms used in other sections, when the SDS was created or revised and changes that were made from previous versions.

***In this new format, each Section will always contain similar information. For example, Section 8 (Exposure Controls/Personal Protection) will always contain information about exposure limits, engineering controls and ways to protect yourself, including personal protective equipment.*

Section 3: Chemical Hazard Categories

There are many kinds of chemicals on a jobsite, and it is useful to know that chemicals are grouped into categories based on how they act and their hazards. The categories of chemicals are:

- Flammables
- Corrosives
- Toxics
- Reactives
- Compressed gases

The categories can be grouped further according to the type of hazard that is most likely to cause injury from that chemical. Knowing this information will help you work more safely with the chemical.

Physical hazards are more likely to be caused by flammables, reactives, combustible dusts, pyrophoric gases, and compressed gases.

Health hazards are more likely to be caused by corrosives, toxins, and simple asphyxiants.

Simple asphyxiants are substances or mixtures that displace oxygen in the ambient atmosphere and can cause oxygen deprivation.

Combustible dust is a particulate solid that becomes a fire or explosion hazard when suspended in air or in another oxidizing medium over a range of concentrations.

Pyrophoric Gas is a chemical in a gaseous state that will ignite spontaneously in air at or below a temperature of 130 degrees F.

Hazards not otherwise classified (HNOC) – HNOC describes adverse physical or health effects based on scientific evidence that does not currently meet federal OSHA's specified criteria for a physical or health hazard class. These hazards do not need to be disclosed on a label, but must be disclosed on Section 2, Hazard Identification, on its SDS.

The following information provides definitions, examples, hazards, and safe handling and storage for each chemical category:

Flammables

Flammable materials include those that will burn when ignited at or below room temperature. Some chemicals must be heated before they will burn. It's important to remember that flammable materials will burn only when the right concentration of material is in there to ignite it.

Flammable materials include: Gasoline, Propane, Aerosols

How Can They Hurt Me?
Flammables that are involved in an uncontrolled fire pose the risk of burns to the skin or lungs. Contact with a flammable on the skin can eat away the fatty protective layer immediately under the skin and lead to irritation. In addition, some flammables have toxic vapors, which will require employees to use respirators.

Safe Handling and Use of Flammables

- Eliminate sources of flame and ignition (i.e. heat, sparks, fire).
- Don't smoke when working with these materials.
- Keep containers with flammable materials as small as possible.
- Use adequate ventilation.
- Clean up spills promptly.
- Keep containers tightly closed.
- Store flammable-soaked rags in covered, metal containers.
- Ground containers when dispensing.
- Use explosion-proof wiring and equipment.
- Use proper Personal Protective Equipment (PPE).

Safe Storage of Flammables
Flammables, especially solvents, should be stored in liquid-tight, unbreakable containers designed for flammable liquids. These containers should have flame arrestors and spring-loaded covers. Take care to store flammables away from oxidizers and corrosives.

Corrosives

Acids and bases are corrosives and can cause damage when they contact the skin or eyes or are inhaled. Bases are sometimes called caustics or alkalis. These materials can dissolve clothing and corrode workplace equipment.

Corrosive materials include: Hydrochloric acid for etching concrete and Sodium hydroxide for cleaning parts.

How Can They Hurt Me?
Corrosives can cause damage to the skin, eyes or lungs on contact. Tissue damage (burns) can be severe and deep, especially to the eyes.

Safe Handling and Use of Corrosives

- When combining acid with water, slowly add acid to the water.
- Store bases and acids in separate places.
- Use proper Personal Protective Equipment (PPE).
- Use adequate ventilation.
- Don't wear contact lenses when working with corrosives.

Safe Storage of Corrosives
Acids and bases should be stored in separate places. Keep corrosives away from flammables. Corrosives may cause leaks in the containers of flammables and lead to fires.

Toxics


Health Hazards


Irritant


Acute Toxicity


Environmental Toxicity

Toxic materials are substances which may cause chronic or acute damage to living tissue, impair the central nervous system, or cause severe illness or death. The level of toxicity depends on how much the person had been exposed to as well as how often and for how long.

<u>*Solvents*</u> are common toxic materials in the workplace. Solvents can cause irritations to the eyes and skin in high concentrations. Most will dissolve the protective layer of oils on the skin and turn it white. Early signs of overexposure include headache, dizziness, and nausea.

Example: Acetone (paint thinner)

<u>*Metals and Particulate Solids*</u>, which are usually given off when welding or grinding, can also be toxic. Dusts can irritate the skin, be inhaled, or ingested with food or smoking materials if they are not washed off the hands and removed from clothing.

Examples: Welding fumes, Asbestos, Silica

<u>*Lubricants, Coolants and Machine Oils*</u> are used in machines and equipment. There are three types: petroleum based (straight oils), water based, and synthetic fluids, which contain no oils. Oils can be in the form of a fume or mist which can be irritating to the eyes and lungs. Skin exposure can result in acne-like conditions.

<u>*Plastics, Epoxies and Polymers*</u> are a group of industrial chemicals. Most of these materials are not toxic in their final forms; however, when they are heated or altered, they can cause significant hazards.

Examples: Plexiglas, Synthetic rubber, Vinyl, Adhesives

<u>*Sensitizers*</u> react with the body's immune system. On the first exposure, which may be high, mild irritation may be experienced. But in future smaller exposures, severe immune reactions, hives and asthma-like symptoms can be disabling and even fatal.

Examples: Sprayed foam insulation, Oil-based paints

<u>*Mutagens*</u> cause a change in the genetic makeup of a cell. Those that cause cancer are called carcinogens, and those that change the reproductive cells and can cause birth defects are called teratogens.

How Can Toxics Hurt Me?
Any material can be hazardous under the wrong conditions. The degree of hazard depends on the dose. Acute effects are usually due to sudden overexposure to large quantities or concentrations of a material.

Chronic effects are not as easy to recognize. They often result from low levels of exposure over a long period of time and typically affect one or more of the body's organ systems.

Safe Handling and Use of Toxics

- Minimize contact with toxic materials.
- Use ventilation to draw contaminants away from the air.
- Use proper Personal Protective Equipment (PPE).

Safe Storage of Toxics
Use storage methods that minimize the release of volatile materials. Make sure solvent containers are tightly capped and stored in ventilated areas, where possible. Use local exhaust ventilation to capture released material.

Reactives

Oxidizers

Explosive

Reactives are materials that can change violently when combined with certain other materials or conditions. Oxidizers, the most commonly found reactive, add oxygen where burning is occurring, making the fire more intense.

Examples of Reactives: Oxygen, Acetylene

How Can They Hurt Me?
Many reactives are toxic, corrosive or both. The physical hazard caused by a reactive is usually heat, a fire, or an explosion. Some reactives give off toxic gases when combined with other materials.

Safe Handling and Use of Reactives

- Use proper Personal Protective Equipment (PPE).
- Check SDS to identify incompatible materials.

Safe Storage of Reactives
Reactives should be stored away from other types of hazards.

Compressed Gases

Compressed gases present a range of hazards. Some, such as methane, are simple asphyxiates; they prevent the body from getting enough oxygen by displacing it from the air. Other gases, like carbon monoxide, are chemically hazardous and poison the body's systems.

Some gases are also very reactive and must be dealt with using carefully designed engineering controls. For instance, natural gas is highly flammable and needs to be controlled to prevent release and coming in contact with an ignition source.

How Can They Hurt Me?
Many gases can be toxic, and any material can be hazardous under the wrong conditions. Gas cylinders can explode or move uncontrollably causing serious and fatal injuries.

Safe Handling and Use of Compressed Gases
Always transport cylinders with the safety cap installed, and use a cylinder cart. Do not roll them or transport them loosely. Always use

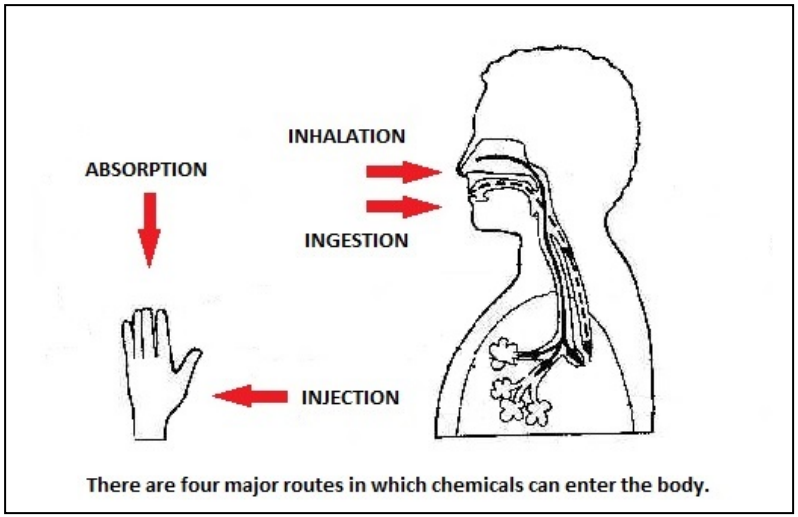
the correct pressure regulator for the specific gas. Valve fittings differ for inert gases, flammable gases and oxidizers - use the correct fitting. Cylinders must be clearly marked with the chemical name.

Safe Storage of Compressed Gases
Always store cylinders upright and secure. Do not store cylinders with the regulator in place.

Section 4: How Chemicals Enter the Body

Chemicals get into the body in four ways or routes of entry.

- Inhalation (breathing)
- Absorption (through the skin/eye)
- Injection (through a skin puncture)
- Ingestion (swallowing)



There are four major routes in which chemicals can enter the body.

Inhalation is the most common route of entry. Simply stated, this occurs when you breathe the substance into the body.

Some chemical vapors, gases or solid particulates (fumes and dust), when inhaled, can cause lung damage. Once in the lungs, the chemical can enter your bloodstream. Once in the bloodstream, the body's circulatory system can transport the chemical to internal organs.

Common sense tells you that if you can smell a chemical, you're probably inhaling it. Unfortunately, not all chemicals can be smelled, nor do they have distinctive taste. As a result, not all chemicals warn

you of their presence. Carbon monoxide, for example, is one gaseous chemical which has no odor or taste. It is a silent killer.

Absorption is the entry of a chemical into your body through the skin or eye. Your skin is normally an excellent barrier for keeping chemical contaminants from entering your body. But if your skin is cut or damaged, or if the chemicals aren't stopped by healthy skin, then the chemicals can enter the body through this opening. Wash your hands and face before eating, drinking, or using tobacco products.

Injection - In some instances, chemicals may enter by injection through the skin. This may occur by a puncture wound (nail or rebar) or by a high-pressure hose. Once in the blood stream, chemicals can be transported throughout the body where they may exert their effects.

Ingestion is the swallowing of toxic materials through the mouth and then being absorbed through the digestive tract. To minimize, good hygiene practices need to be observed – wash your face and hands prior to eating and drinking.

***Summary - In areas where chemicals are present, it is good practice not to eat, drink or use tobacco products. Meals and breaks should be taken in a separate clean area, only after washing your hands and face. In addition, the use of gloves and proper respiratory protection will reduce your exposure to chemicals.*

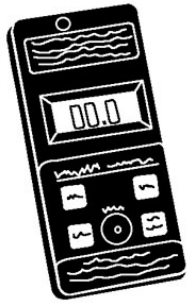
Section 5: Detection of Hazardous Chemical Exposures

There are several methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area.

These following signs and symptoms of chemical exposure are your body's way of reacting to foreign substances and are meant to alert you that they may be causing harm.

- Odor
- Eye, nose, throat irritation
- Coughing, sneezing, breathing difficulty
- Skin rashes and irritation, change in skin color
- Fatigue, weakness, nausea, dizziness
- Headache, irritability, cold sweats

Worksites may monitor the air to determine chemical exposure levels. There are two types of monitoring: real-time and samples sent to a lab. Real-time equipment can give immediate chemical exposure measurements for combustive gases, toxic vapors and gases, and oxygen.



Monitoring results are evaluated based on exposure limits. Government and health professionals evaluate the hazards of materials and decide upon exposure limits. These levels are called Threshold Limit Values (TLVs). The TLV indicates the limit of exposure that a person should have during an 8-hour workday and a 40-hour work week. The TLV for a certain material can be found on the Safety Data Sheet. TLVs should not be exceeded.

Exposure limits are also referred to as Permissible Exposure Limits (PELs). These are the limits set by OSHA.

Section 6: Emergencies and First Aid

- If a chemical gets into your eyes, flush the eyes with clean running water for at least 15 minutes, and then seek medical attention.
- If a chemical gets on your skin, causing irritation, wash the area of contact and seek medical attention.
- If you begin to feel nausea or dizziness from inhaling chemical vapors, move to fresh air and seek medical attention.
- Refer to the SDS for specific first-aid instructions.

Section 7: Conclusion

Follow these general rules when working with a hazardous chemical:

- Read the label.
- If you need more information, obtain the Safety Data Sheet.
- Always use the proper Personal Protective Equipment (PPE).
- If you have questions, ask your foreman or supervisor.

***Remember: Labels and Safety Data Sheets are key sources of information for learning about how to safely use chemicals.*

EMPLOYEE TRAINING VALIDATION

I have been trained according to the requirements of the OSHA Hazard Communication standard and received appropriate company information. I understand the company Hazard Communication policy and have been informed of the location of the written Hazard Communication program and the SDSs.

Print Employee Name: _____

Signature of Employee: _____

Date: _____

Signature of Company Representative: _____

REQUIRED CATEGORIES	**READ BY EMPLOYEE**
Introduction (page 2)	_____
Hazard Communication (pages 3-8) • Chemical Labels, Pictograms, and SDSs	_____
Chemical Hazard Categories (pages 9-14)	_____
How Chemicals Enter the Body (pages 14-15)	_____
Detection of Chemical Exposures (pages 15-16)	_____
Emergencies and First Aid (page 16)	_____
Conclusion (page 16)	_____

EMPLOYER TO REVIEW	**EMPLOYEE RECEIVED**
Location of company hazard communication program, list of chemicals, and SDSs.	_____
Operations where hazardous chemicals are present.	_____
Work practices, emergency procedures, and personal protective equipment to be used around hazardous chemicals.	_____

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