

Safety Presentation On



Hazard Communication "RIGHT-TO-KNOW"

Goals of Right to Know:

- To help you reduce the risks involved in working with hazardous materials
- To transmit vital information to employees about real and potential hazards of substances in the work place
- To reduce the incidence and cost of illness and injury resulting from hazardous substances
- To promote public employer's need and right to know
- To encourage a reduction in the volume and toxicity of hazardous substances

Introduction



- About 35 million workers work with and are potentially exposed to one or more chemical hazards
- There are approximately 650,000 existing chemical products, and hundreds of new ones being introduced annually
- Chemical exposure may cause or contribute to many serious health effects such as heart ailments, central nervous system damage, kidney and lung damage, sterility, cancer, burns, and rashes
- Some chemicals may also be safety hazards and have the potential to cause fires and explosions and other serious accidents

The Hazard Communication Standard states that companies which produce and use hazardous materials must provide their employees with information and training on the proper handling and use of these materials.

You, as an employee, have a Right to Know about the hazardous materials used in your work area and the potential effects of these materials upon your health and safety.

Key Elements of the Hazard Communication Standard

Hazard Communication Standard is composed of five key elements. These five key elements are:

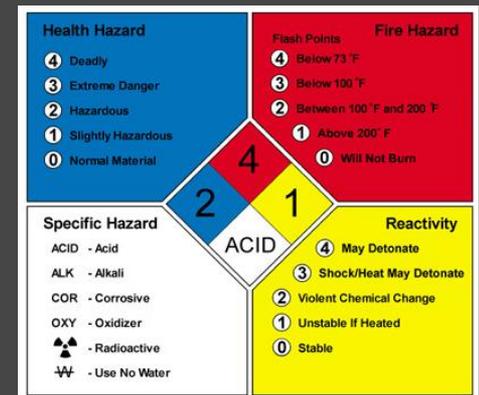
1. **Materials Inventory** - A list of the hazardous materials present in your work area.
2. **Material Safety Data Sheets** - A detailed description of each hazardous material listed in the Materials Inventory.
3. **Labelling** - Containers of hazardous materials must have labels which identify the material and warn of its potential hazard to employees.
4. **Training** - All employees must be trained to identify and work safely with hazardous materials.
5. **Written Program** - A written program must be developed which ties all of the above

Labelling - 1

- ⊕ Hazardous materials (chemical products) are everywhere. It has been estimated that over a half million chemical products are used by business and industry every year. Some of these chemical products pose little danger to you, while others are deadly.
- ⊕ Modern manufacturing would not be possible without chemicals. However, like machinery or electrical equipment, you must know how to use chemicals safely.
- ⊕ The first step in using chemicals safely is to recognize those materials that may be hazardous to your health or physical safety.

- **What Do I Need to Know?**

- Employees often ask themselves the following questions:
 - 1. How can this material hurt me?
 - 2. What can I do to protect myself?
 - 3. Where can I find the answers to the first two questions?



Labelling - 2

Where to Find the Information You Need

- ✍ Your most immediate source for information can be found on labels attached to containers which hold various hazardous materials.
- ✍ Your second source of information is Materials Safety Data Sheets (MSDSs). Material Safety Data Sheets will be discussed in the next section.

What Must Be Labelled

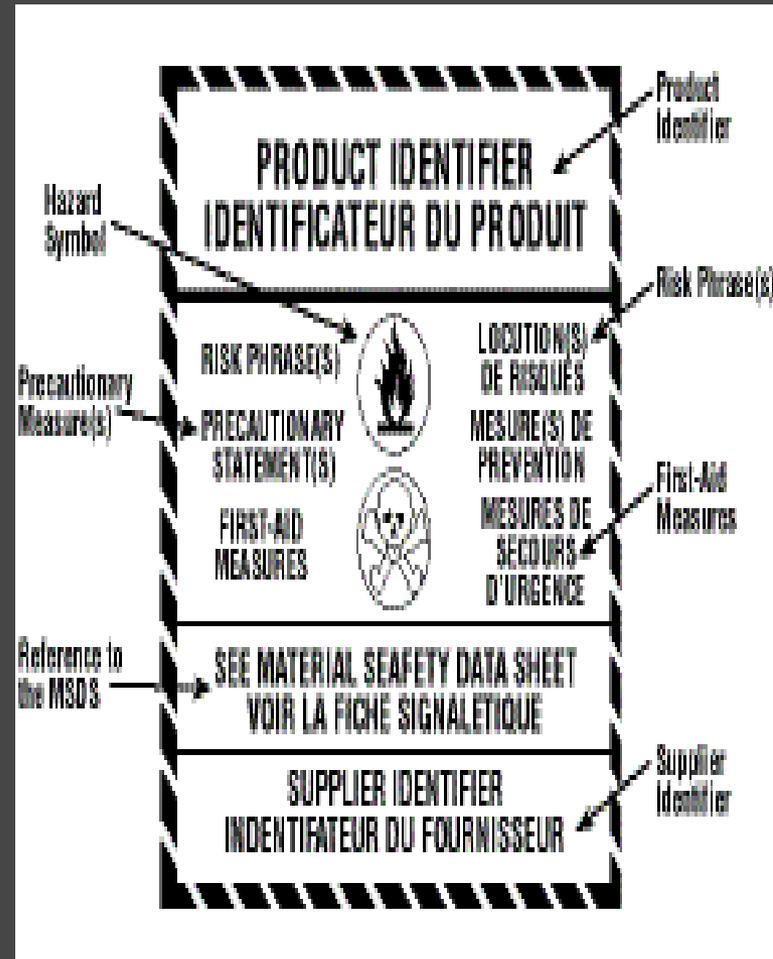
- The Hazard Communication Standard requires that ALL hazardous materials be labelled. Labels must appear either on the container itself, the batch ticket, placard, or the process sheets.
- Hazardous chemicals in portable containers which are for the immediate use of the employee who performs the transfer is the exception to this rule.

Labelling - 3

Basic Label Information

Hazcom requires that the following information be included on ALL labels:

1. The product name;
2. A warning statement, message or symbol; and
3. On commercial labels, manufacturers of hazardous materials must include their name and address. Many manufacturers also include a statement describing safe handling procedures



Labelling - 4

Commercial Labels

Below is an example of a warning label from a can of rubber cement thinner.

1. A warning statement, message or symbol
2. The product name
3. Safe handling procedures
4. Manufacturer's name and address

Key Words

As you read labels, you will see key words which signal you that you should take extra care when handling a particular hazardous material. These key words include:

CAUTION

MODERATE RISK

WARNING

DANGER

SERIOUS RISK

MAJOR RISK

WARNING - MAY PRODUCE DAMAGE TO CENTRAL AND PERIPHERAL NERVOUS SYSTEMS BY SKIN CONTACT OR BY INHALING VAPORS. CONTAINS n-HEXANE (CAS110-54-3).

Avoid inhaling vapors or skin contact. Use only in a well ventilated area. When using, do not eat, drink or smoke. If swallowed, do NOT induce vomiting. CALL PHYSICIAN IMMEDIATELY.

**ABC Rubber Cement Company.
Altonia, Ill.**

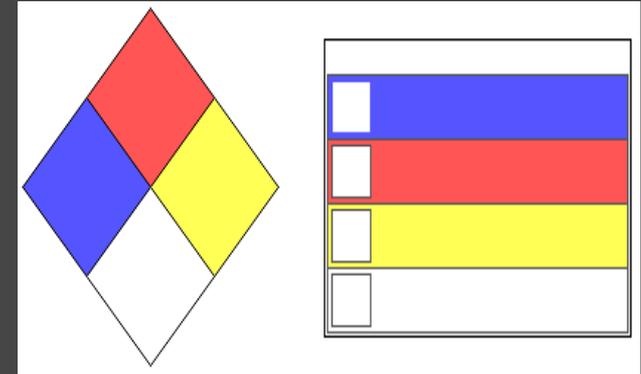
Labelling - 5

- For example, the key word "DANGER" means:
 1. Protective equipment and/or clothing is required before use;
 2. Misuse can result in immediate harm, long term effects, or death; and
 3. The chemical may be toxic, corrosive, or flammable.

Labelling - 6

Plant Labels

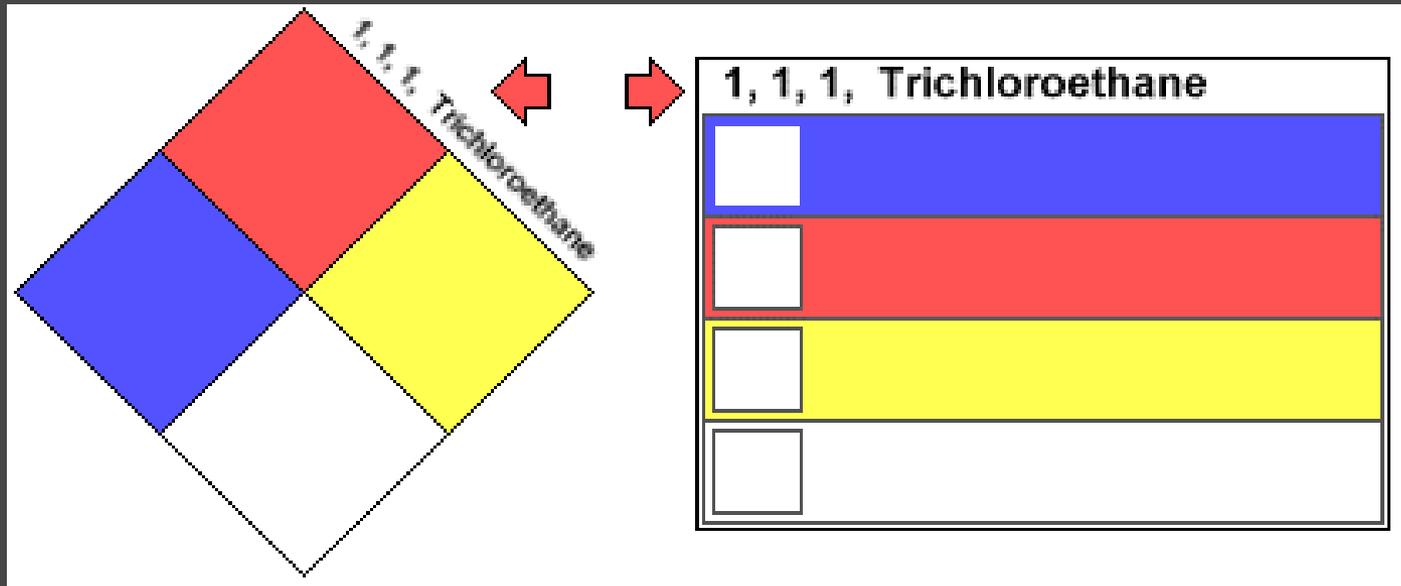
- In addition to commercial labels, many organizations use labels such as those shown below. Or, your organization may use a specially designed label which contains the same information. Contact your supervisor for more information about the labels used by your organization.



Labelling - 7

Chemical Name

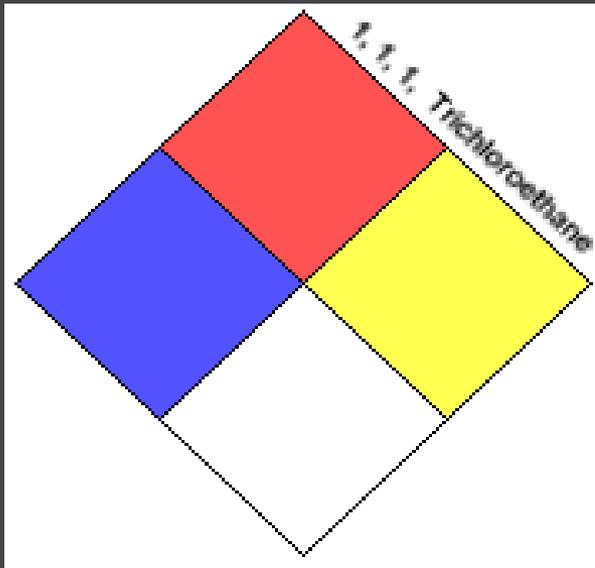
Toward the top of the label will be the chemical trade name of the hazardous material.



Labelling - 8

Hazard Class

Each colour bar or small diamond represents a different class of hazard. The hazard classes found on labels include Health, Flammability, Reactivity, and in some cases, Special Hazards. Each hazard class uses a different colour and a rating scale from 0 - 4.



1, 1, 1, Trichloroethane	
	HEALTH
	FLAMMABILITY
	REACTIVITY
	PROTECTIVE EQUIPMENT

Labelling - 9

Health Hazards

The first hazard class is Health Hazards. This hazard class colour is **BLUE**.

The rating scale for Health Hazards is listed below:

0 - No Hazard

1 - Slight Hazard

2 - Dangerous

3 - Extreme Danger

4 - Deadly



Labelling - 10

Flammability Hazards

The second hazard class is Flammability Hazards. This hazard class colour is **RED**. The rating scale for flammability hazards is based on the flash point of the material. The flash point is the temperature at which the material gives off enough vapours to sustain ignition.



0 - Will Not Burn

1 - Ignites Above 200 Degrees Fahrenheit

2 - Ignites Below 200 Degrees Fahrenheit

3 - Ignites Below 100 Degrees Fahrenheit

4 - Ignites Below 73 Degrees Fahrenheit

Labelling - 11

Special Hazards

Diamond shaped labels include a fourth hazard class called Special Hazards. This hazard class colour is **WHITE**.

These special hazards are represented by the following symbols:

~~W~~ - Water Reactive

OX - Oxidizer

 - Radioactive

COR - Corrosive

ACD - Acid

ALK - Alkali



MSDS - 1



Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) provides detailed information about a specific hazardous material. An MSDS contains the following information:

- Identity (name of substance)
- Physical Hazards (target organ)
- Health Hazards
- Routes of Body Entry
- Permissible Exposure Limits (PEL)
- Carcinogenic Factors (cancer causing)
- Safe-Handling Procedures
- Date of Sheet Preparation
- Control Measures (personal protective equipment)
- Emergency First Aid Procedures (emergency telephone number)
- Contact Information (for the preparer of the sheet)
- Special Instructions

A sample Material Safety Data Sheet (MSDS) form from the U.S. Department of Labor, Occupational Safety and Health Administration. The form is titled "Material Safety Data Sheet" and includes instructions for use. It is divided into several sections: Section I (Manufacturer's Name, Address, Telephone Number, Date Prepared, Signature of Preparer), Section II (Hazardous Ingredients/Identify Information), Section III (Physical/Chemical Characteristics), and Section IV (Fire and Explosion Hazard Data). The form also includes a table for Hazardous Components and a table for Physical/Chemical Characteristics. The form is dated 12/18/2012 and includes a small logo in the top right corner.

MSDS - 2

Sample MSDS Page - Nitric Acid, 70%

- This is a sample page from the MSDS for Nitric Acid, 70 percent. The product is made by the ABC Rubber Company, Science Products Division, P.O. Box M, Altonia, Illinois 40361. Effective date is 8-21-85.

Product identification, synonyms, other names for nitric acid are: aqua forties, azotic acid, nitric acid 70 percent. Formula CAS Number 7697-37-2. Molecular weight 63.00. Hazardous ingredients, not applicable. Chemical formula, HNO_3 .

Precautionary measures, danger, strong oxidizer, contact with other materials may cause fire. Causes sever burns, may be fatal if swallowed. Harmful if inhaled. Do not get in eyes, on skin, or on clothing. Avoid breathing mist, use only with adequate ventilation. Wash thoroughly after handling. Do not store near combustible materials.

When Do You Use an MSDS?

You should use an MSDS whenever you need additional information about a hazardous material that is not included on the product label. For example, you have spilled nitric acid on the floor, and you need to know how to clean it up safely. You need only refer to the "Safe-Handling Procedures" section of the nitric acid MSDS.

Safe-Handling Procedures Section - Nitric Acid, 70%

The Safe-Handling Procedures section of the Nitric Acid MSDS provides the following information:

Isolate or enclose the area of the leak or spill. Clean-up personnel should wear protective clothing and respiratory equipment suitable for toxic or corrosive fluids or vapours. For small spills: Flush with water, and neutralize with alkaline material (soda ash, lime, et cetera). Sewer with excess water. For larger spills and lot sizes: Neutralize with alkaline, pick up with absorbent material (sand, earth, vermiculite) and dispose in a RCRA - approved waste facility or sewer the neutralized slurry with excess water if local ordinances allow. Provide forced ventilation to dissipate fumes.
Reportable Quantity (RQ) (CWA/CERCLA): 1000 pounds
Insure compliance with local, state and federal regulations.

When Do You Use an MSDS?

Some chemicals, such as sodium hydroxide, are very dangerous. If you have an accident, you may not have time to look up the information you need in an MSDS. You should read the MSDSs for the hazardous materials present in your work area before you work with them.

How to Find an MSDS

Ask your supervisor or manager where MSDSs are located. Take time to read the MSDSs which describe the hazardous materials present in your work area. Remember, knowing where MSDSs are located and how to use them is your responsibility; it is part of your job.

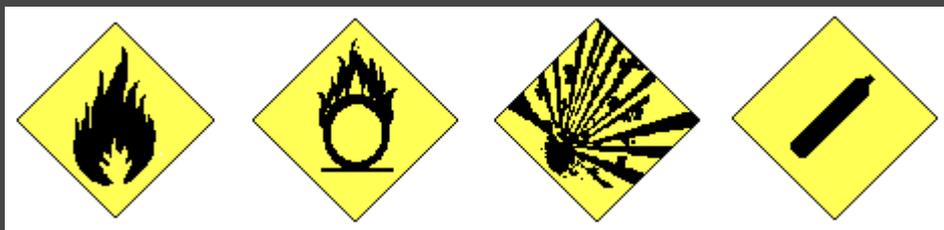
Physical Hazards - 1

Physical Hazard

What is a Physical Hazard?

Physical hazards are those substances which threaten your physical safety. The most common types of physical hazards are:

- Fire
- * Explosion
- * Chemical Reactivity



Physical Hazards are one of two major classes of hazardous materials

Communication Standard. The other major hazard class is Health Hazards. In this session, we will be looking at various types of physical hazards and what you need to know to use these materials safely. To help you identify materials which are physical hazards, the symbols shown below are often used.

Physical Hazards - 2

Working with Materials That Use the Fire Symbol

Materials Which Use the Fire Symbol

There are three classes of materials which use the fire symbol.

1. **Flammables** can be gases, liquids or solids. Flammables ignite easily and burn rapidly. Liquid flammables have a flashpoint under 100 degrees Fahrenheit.
2. **Combustibles** are similar to flammables, but they do not ignite as easily. Liquid combustibles have a flash point above 100 degrees Fahrenheit.
3. **Pyrophoric**, or spontaneous combustion materials, burst into flames "on their own" at temperatures below 130 degrees Fahrenheit.

Whenever you work with a material that uses the fire symbol, be sure to read the warning label and the MSDS for safe handling procedures. With flammables, combustibles, and pyrophorics, do not expose these materials to sparks, flames or other heat sources. You must also not smoke or light a match or flame near them.



Physical Hazards - 3

Materials That Use the Explosive Symbol

1. **Explosives** are materials which release a tremendous amount of energy in the form of heat, light and expanding pressure within a very short period of time.
2. **Water Reactive** react with water and may explode, or they may release a gas which is flammable.
3. **Unstable Reactive** are chemicals that can react or can become self-reactive when subjected to shock, pressure or temperature.

Whenever you work with a material that uses the explosive symbol, be sure to read the warning label or the MSDS for safe handling procedures. Because materials that use the explosive symbol are often very dangerous to work with, you may need additional training or instructions from your supervisor. Always check with your supervisor before handling or using materials that use the explosive symbol.



EXPLOSIVE

Physical Hazards - 4

Materials That Use the Flaming "O" Symbol

1. **Oxidizers** cause other substances to burn more easily through a chemical reaction or change.
2. **Organic Peroxides** contain oxygen and act as powerful oxidizers.

Whenever you work with a material that uses the **Flaming "O" symbol**, be sure to read the warning label and the MSDS for safe handling procedures.



Physical Hazards - 5

Materials That Use the Cylinder Symbol

- 💣 Many gases such as nitrogen, oxygen, and acetylene are used in the manufacturing process. In order to transport, store and use these gases, they are "bottled" under great pressure in tanks called gas cylinders.
- 💣 Great care should be taken when you handle gas cylinders to insure that they are not damaged when they are moved or used. In addition, you should read the warning label and the MSDS for safe handling procedures concerning the gas contained in a gas cylinder.



Health Hazards - 1

Health Hazards

Health Hazards are one of two major classes of hazardous materials covered by the OSHA Communication Standard. The other major hazard class is Physical Hazards. In this session, we will be looking at various types of health hazards and what you need to know to use these materials safely. To help you identify materials which are health hazards, the symbols shown below are often used..



Health Hazards - 2



Health Hazards

Toxicity vs. Hazard

The term **toxicity** is used to describe the ability of a substance to cause a harmful effect. **EVERYTHING** is toxic at some dose. Even water! If someone drinks too much water at any one time, it can cause death.

Toxicity vs. Dose

There is a balance between **toxicity** and **dose**. **Dose** is the **AMOUNT** of something you are exposed to, or come in contact with. The less the toxicity, the greater the dose you can tolerate without ill effects. The greater the toxicity, the less dose you can tolerate without becoming sick.

Health Hazards - 3



Hazard Potential

Hazard Potential is the likelihood that a specific chemical or substance (toxic material) will cause an ill effect at a given dose. The following screens will help you to understand the relationship between toxicity, dose, and hazard potential.

The Most Accurate Way

Hazard potential is the most accurate way to rate how dangerous a substance is when used under a given set of circumstances. Neither the toxicity or the dose rating alone provides you with enough information on how to use a hazardous material safely. Your real concern must always be with a hazardous material's hazard potential.

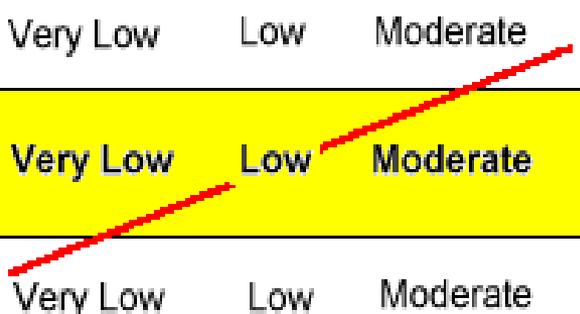
Health Hazards - 4

Hazard Potential

High Toxicity - Low Dose

For example, acetone is a highly toxic chemical. But you could work safely with it, if you were outside or in a well ventilated room where your dose would be very low. As the chart below shows, your hazard potential for working with acetone in a well ventilated room would be low.

TOXICITY	Very Low	Low	Moderate	High	Very High
HAZARD POTENTIAL	Very Low	Low	Moderate	High	Very High
DOSE	Very Low	Low	Moderate	High	Very High



Health Hazards - 5



Hazard Potential

Low Toxicity - High Dose

Let's take another example. Nitrogen gas has a low toxic rating. It is found in great amounts in the air we breathe. However, if you were in a confined space that had only nitrogen gas in it (a very high dose), you would soon die because of the lack of oxygen. As the chart below indicates, your hazard potential for working in a room filled with nitrogen would be high.

TOXICITY	Very Low	Low	Moderate	High	Very High
HAZARD POTENTIAL	Very Low	Low	Moderate	High	Very High
DOSE	Very Low	Low	Moderate	High	Very High

Safe Exposure Limits

Much research has been done by government agencies and groups to establish safe exposure limits for the chemicals used in your work area. These limits are based upon a **Time Weighted Average or TWA**. TWAs have been established for all the chemicals you work with and limit the average amount of a chemical you can be exposed to over an eight hour day.

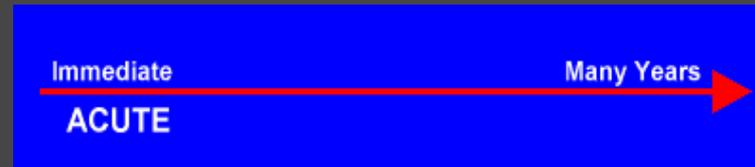
Within the facility, materials which are health hazards are monitored on a regular basis to insure that no one is overexposed.



Health Hazards - 7

Acute vs. Chronic The effects of health hazards are classified as either:

1. Acute
2. Chronic

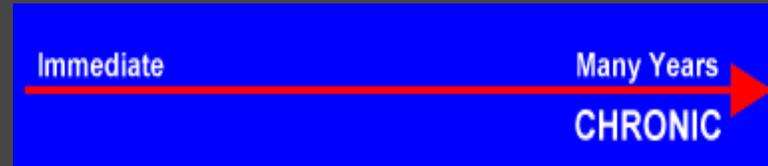


Acute Health Hazards

Acute Health Hazards are those whose effects occur immediately or soon after you come in contact with them.

For example, you accidentally spill a strong acid on your hand. The acid will begin to burn your hand immediately. Or, you begin to work with a paint solvent in a closed area, and the fumes make you feel dizzy.

Chronic Health Hazards



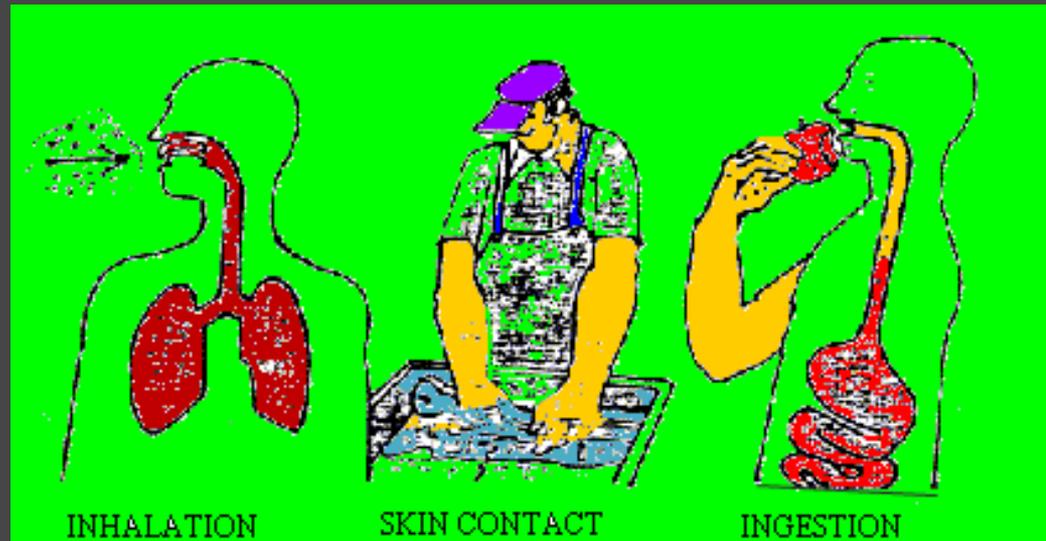
Chronic Health Hazards, on the other hand, are those whose effects take years or decades to occur after many exposures.

An example of a chronic health hazard would be asbestos. The dangerous effects for people who have been overexposed to asbestos take years to appear and have been linked to a number of fatal lung diseases.

Routes of Exposure

It's important to remember that hazardous materials present a health hazard only when they come into contact with the body. Chemicals can enter the body in three ways:

1. Inhalation
2. Skin absorption
3. Ingestion



Routes of Exposure

Inhalation

Inhalation is the most common route of exposure for most health hazards. This includes breathing in dust, fumes, oil mist, and vapours from solvents and various gases.

Skin Contact

Some chemicals are absorbed into the body through skin contact. If a chemical is readily absorbed into the skin, then the notation "skin" will appear along with the occupational exposure limits on the MSDS. Corrosive chemicals can cause burns and tissue destruction. Extra care must be taken to prevent skin and eye contact with these chemicals. This is why wearing aprons, gloves, eye protection, and other protective clothing is important when working with some chemicals.

Ingestion

It is possible to accidentally eat chemicals that are health hazards. To insure that you do not accidentally eat any of the chemicals you work with: 1. Never eat foods in areas where chemicals are used. 2. Never smoke in areas where chemicals are used. 3. Wash your hands and face with soap and water after working with chemicals before you eat, drink, or smoke.

Controlling Physical and Health Hazards

There are a number of ways that you can safeguard your health and physical safety when using hazardous materials. These measures include:

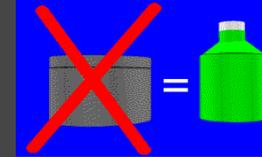
- * Product Substitution
- * Engineering Controls
- * Safe Work Practices
- * Personal Protective Equipment
- * Training and Communication
- * Environmental Monitoring
- * Personal Monitoring

Protective Measures - 2

Controlling Physical and Health Hazards

Product Substitution

Because many chemicals do similar jobs, it is important to select chemicals that do a good job, while being less toxic.



Engineering Controls

Well designed work areas minimize exposure to materials which are hazardous. Examples of engineering controls would include exhaust systems and wetting systems to control dust.

Safe Work Practices

Safe work practices will insure that chemicals are used correctly and safely.

Personal Protective Equipment

Masks, eye protection, gloves, aprons, and other protective equipment and clothing are designed to protect you while you work. USE THEM!

Protective Measures - 3

Controlling Physical and Health Hazards

Training and Communication

Knowing how to work safely with chemicals that pose a hazard is an important activity. This is the reason for this training, bulletin boards in the plant, safety meetings, MSDSs, and various bulletins. You have a right to know, but you also have a responsibility to use the knowledge and skills to work safely.



Environmental Monitoring

Industrial hygiene personnel regularly sample the air and collect other samples to insure that hazardous chemicals do not exceed established acceptable exposure limits

Personal Monitoring

Monitor yourself and others. Be on the lookout for any physical symptoms which would indicate that you or your co workers have been overexposed to any hazardous chemical. Symptoms, such as skin rashes, dizziness, eye or throat irritations or strong odours, should be reported to your supervisor.

Who is covered?

Hazard Communication (HazCom) standard applies to

- General industry
- Shipyard
- Marine terminals
- Long shoring
- Construction employment
- Covers chemical manufacturers,
- Importers
- Employers, and
- Employees exposed to chemical hazards.

Employer Responsibilities



- Identify and list hazardous chemicals in their workplaces
- Obtain Material Safety Data Sheets (MSDSs) and labels for each hazardous chemical, if not provided by the manufacturer, importer, or distributor
- Implement a written HazCom program, including labels, MSDSs, and employee training
- Communicate hazard information to employees through labels, MSDSs, and formal training programs

How can workplace hazards be minimized?

The first step in minimizing workplace hazards is to perform a thorough hazard assessment

Employers can rely on the evaluations performed by the manufacturers or importers to establish the hazards of the chemicals they use

Training



- Training is required for employees who are exposed to hazardous chemicals in their work area:
- At the time of initial assignment
- Whenever a new hazard is introduced into their work area

What training is needed to protect workers?

- ☠ Explanation of the HazCom program, including information on labels, MSDSs, and how to obtain and use available hazard information
- ☠ Hazards of chemicals
- ☠ Protective measures such as engineering controls, work practices, and the use of PPE
- ☠ How to detect the presence or release of a hazardous chemical (using monitoring devices, observation, or smell)

What information must be provided to workers?

- * The HazCom standard and its requirements
- * Operations in their work areas where hazardous chemicals are present
- * Location and availability of the written hazard evaluation procedures, communications program, lists of hazardous chemicals, and the required MSDSs
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Summary

- ✍ Hazard Communication Standard is based on a simple concept - that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working
- ✍ Employees also need to know what protective measures are available to prevent adverse effects from occurring

