

Hazard Communications Program

North Dakota State University
University Police & Safety Office

Hazard Communication

- Hazard Communication (“hazcom”) or the Right to Know Law is a program where you are trained on the hazardous chemical used in the workplace.
- You are also required to be trained on how to protect yourself from the effects of these hazards.
- As an employee, you are required to follow the Hazard Communication Program

Hazard Communications Program

- Chemical Manufacturers are required to:
 - Determine a chemical's hazards
 - Provide labels and Material Safety Data Sheets
- The Employer is required to:
 - Provide a written hazard communications program
 - Maintain the Material Safety Data Sheets (MSDSs)
 - Make the written program and MSDSs readily available in the work area
- Employees are required to:
 - Read labels, MSDSs and identify hazards
 - Follow instructions, warnings and participate in training

Hazard Communications Program

- What is a “hazardous chemical”?
 - A hazardous chemical is any chemical that can do harm to your body.
- Three Forms of Chemicals
 - Solids
 - Dust or powder – (Cutting, drilling, grinding, sanding, dry sweeping, soaps, etc.)
 - Fumes – (extremely small droplets when something is vaporized.)
 - Fibers – similar to dust, but has an elongated shape

Types of Chemicals

– Liquids

- Liquids can come into direct contact with the skin and be absorbed into the body.
- Liquids can be sprayed and form mists or evaporate and form vapors which can be inhaled or settle on the skin
- Airborne mists can also settle out and contaminate food or drink

– Gases and Vapors

- Gases and vapors enter the body by inhalation

Hazard Communications Program

- How do hazardous chemicals affect the body?
 - The effect a certain chemical has on the body depends on several factors:
 - The physical form of the chemical
 - How the chemical enters the body
 - The amount of chemical that actually enters the body – the dose.
 - The amount of time exposed to the chemical (duration)
 - How toxic (poisonous) the chemical is

Routes of Entry

- There are four routes of entry
 - Ingestion – swallowing the chemical
 - Can rub off dirty hands or settle causing contaminated food, drinks or tobacco products
 - Inhalation – breathing in the chemical
 - The size of the particles or droplets can affect where the chemical settles in the respiratory tract and what symptoms or disease will develop
 - Absorption – skin and eye contact
 - Injection – penetration of the skin

Toxic Chemical Exposure

- Toxicity – how poisonous are chemicals?
- The chemical exposure limits.
 - Many chemicals have exposure limits, or allowable amounts of a chemical in the air.
 - These limits are often called
 - “PELs” (Permissible Exposure Limits or
 - “TLVs” (Threshold Limit Values)
 - They are based on 8-hour average exposure or ceiling or peak levels. Levels must be kept below these limits for safety.

Toxic Chemical Exposure

– Dosage

- The effects of any toxic chemical depends on the amount of a chemical that actually enters the body during a certain time period.
- Acute Toxicity - immediate
 - The measure of how toxic a chemical is in a single exposure over a short period of time. (ammonia, carbon monoxide).
- Chronic Toxicity – over a period of time
 - The measure of the toxicity of exposure to a chemical over a long period of time (asbestos, carbon monoxide)

Toxic Chemical Exposure

- Carcinogens
 - Are known cancer-causing compounds, or suspected as carcinogens.
- Teratogens
 - Compounds that can harm the developing fetus, causing birth defects or death.
- Mutagens
 - Cause genetic mutations or changes (birth defects or other problems in following generations or may lead to cancer in the exposed person).
- Sensitizers
 - Can “switch on” a reaction in an individual worker.
 - Once exposed, small doses can cause reactions to become more severe

Corrosive Chemicals

- Corrosive Chemicals:
 - Acids and bases are common corrosive chemicals.
 - Are capable of damaging skin, eyes and the respiratory system.
 - Can cause visible skin burns or damage.
 - The extent of skin damage depends on how long the corrosive is on the skin and how concentrated the corrosive is.
 - Inhalation of corrosive mists or vapors can cause severe bronchial irritation or damage.
 - Corrosives are especially damaging to the eyes.
 - Examples: sulfuric acid, ammonia, chromic acid, phenol, acetic acid, chlorine.

Flammable Liquids

- Flammable liquids – flammability depends on its physical properties
 - The vapor of a flammable liquid ignites and causes fire or explosion – not the liquid itself.
 - Vapor Pressure
 - Is an indicator of how fast a liquid evaporates
 - The higher the vapor pressure the more rapidly the liquid will evaporate,
 - Is temperature dependent
 - Flash point – is the lowest temperature that a flammable liquid can generate enough vapor to form a mixture with air that will ignite.

Flammable Liquids

- Limits of Flammability
 - The limit is the range that a mixture of air and vapor is flammable.
 - Mixtures can be too lean (not enough vapor) or too rich (too much vapor) to ignite and burn.
 - LEL – “lower explosive limit”
 - UEL – “upper explosive limit”
- Vapor Density
 - “Vapor Density” is a measure of how heavy a vapor is compared to air.
 - Vapors with a density greater than 1.0 are heavier than air and can collect near the floor, and “flow” like a liquid.
 - Vapors with a density less than 1.0 are lighter than air and collect near the ceiling and “flow”.
 - “Flowing” vapors cause a fire/explosion hazard if they find an ignition source.

Hazards of Metals

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

Getting Information

- How do you get information about hazardous chemicals?
 - From the product label & product MSDS
 - Product labels – each container label on hazardous chemicals should include:
 - The name & address of the manufacturer
 - The name of the product
 - Physical and health hazard warning – can be a picture or a symbol
 - A list of hazardous ingredients
 - Special handling instructions
 - Label must be legible, in English and prominently displayed
 - Basic Personal Protective Equipment (PPE) recommendations

Material Safety Data Sheets

- Material Safety Data Sheets or “MSDSs” are information sheets that contain:
 - Chemical name and manufacturer, address, phone number and date the MSDS was prepared or revised.
 - What hazardous ingredients are in the product
 - Physical and chemical characteristics
 - Flammable, explosive and reactivity levels
 - Precautions for safe handling and storage
 - How to control spills and leaks

Material Safety Data Sheets

- Physical hazards of working with the product
- Health Hazards of working with the product
 - Routes of entry
 - Exposure levels (PEL)
 - Symptoms of exposure
 - First-aid and emergency information
- Precautions for safe use of the hazardous chemical
 - Use with adequate ventilation, keep away from open flame
- Is the chemical a carcinogen?

Material Safety Data Sheets

- Personal Protective Equipment (PPE) – will be provided to the worker at no expense per their department.
 - Dust masks and respirators – contact the UP&SO for the respirator use requirements
 - Glasses, goggles and face shields
 - Hearing protection
 - Gloves, aprons or full-body suits
 - Foot and head protection

Material Safety Data Sheets

- Hazardous Material First Aid – Seek immediate medical attention from NDSU’s Designated Medical Provider if necessary
 - Eyes: Flush with water for 15 minutes
 - Skin: Wash with soap and water for 15 minutes
 - Inhalation: Move to fresh air
 - Swallowing: Get emergency medical assistance
- Compliance issues – EPA, FDA, DOT, etc.

MSDS Information

- Information in this slide is provided as a reference for the preparation of an MSDS. The use of existing MSDSs may be helpful for wording in preparation of several sections. A sample form and MSDS are linked as examples. Contact the UP&SO for additional MSDS samples.
- **Generic MSDS:**
 - http://www.ndsu.nodak.edu/ndsu/police_safety/safety/NDSU%20Safety%20Officer%20Homepage_files/Material%20Safety%20Data%20Sheet.pdf
- **Preparing and Understanding MSDS:**
 - http://www.ndsu.nodak.edu/ndsu/police_safety/safety/NDSU%20Safety%20Officer%20Homepage_files/msds.pdf
- **MSDS Online:**
 - <http://www.ilpi.com/msds/index.html>

Protecting Yourself

- In case of a leak or spill
 - Evacuate the area
 - Notify a supervisor immediately of unusual odors, spills, or releases
 - Remove ignition sources (if safe to do so)
 - Stay away or leave the area
 - Call UP&SO or the University Police
- How to protect yourself from the hazards
 - Know what is in the product you are working with
 - Use the smallest amount of a chemical to do the job
 - Wear necessary personal protective equipment (PPE)

Protecting Yourself

- If you have been exposed to a chemical and feel sick
 - Let your supervisor know immediately
 - Find out what the chemical is
 - Follow the first aid directions in the MSDS
 - Get medical attention as needed.
 - Obtain a copy of the MSDS for the Medical Provider
 - Check your PPE before going back to the area.
 - Report it to the UP&SO Claims Specialist and complete the NDSU Incident Report within 24 hours

Training

- Training is required for all employees who are exposed to hazardous chemicals in their work area.
 - Department supervisors are responsible for training their employees on their specific chemical hazards.
 - At the time of initial assignment and annually thereafter
 - When ever a new hazard is introduced into their work area
 - Explanation of the HazCom Program, including information on labels, MSDSs, and how to obtain and use available hazard information
 - Hazards of chemicals and how to detect the presence or release of a chemical
 - Protective measures such as engineering controls, work practices and use of PPE

Sign and Symbol Examples



National Fire Protection Association's 704 Marking System

