

# How to Read a Material Safety Data Sheet (MSDS)

Although they may follow different formats, all Material Safety Data Sheets (MSDS) contain the same type of information and they generally have similar section headings. Below is a summary of the basic information typically found under the following general headings within the MSDS.

## **Names**

- The name and address of the manufacturer, importer, or party responsible for preparing the MSDS.
- The telephone numbers, both emergency and non-emergency.
- The trade names of the materials found on the product label.

## **Hazardous Ingredients**

The chemical will be identified by both its chemical identity and its common name under the following four conditions:

- Any single chemical substance found to present a physical or health hazard,
- Chemical mixtures tested as a whole and determined as hazardous,
- Chemical mixtures, not tested as a whole, but containing 1% or more of ingredients that present a physical or health hazard, and
- Mixture ingredients identified as carcinogens or potential carcinogens and comprise 0.1% or greater of the total mixture.

## **Physical and Chemical Characteristics**

- The melting point, boiling point, density, specific gravity, etc.
- Physical appearance and odor.

## **Fire and Explosion Hazards**

The chemicals' flashpoint (FP), flammable limits (LEL & UEL), recommended extinguishing media, special fire fighting procedures, and unusual fire and explosion hazards.

## **Chemical Stability and Reactivity**

- Chemical stability - whether the chemical is stable or unstable under reasonably perceivable conditions of storage, use and misuse.
- Incompatible materials and their attendant hazards - chemicals or materials that can initiate a potentially dangerous reaction when brought into contact with an otherwise stable substance.
- Decomposition (the breakdown of a chemical into simpler chemicals) - the causes and whether the decomposition products are hazardous.
- Polymerization (the forming of chemical bonds that results in a long chain molecule called a polymer) - this reaction can be hazardous if enough heat is released to cause a fire or explosion.
- Whether the chemical reacts readily with air.
- Whether the chemical changes its structure when exposed to various combinations of temperature, pressure, and light conditions.

## **Health Hazard**

- Routes of entry - inhalation, ingestion, injection and absorption of the chemical through the skin. Be aware of all the potential routes of entry based on the parts of the body that are exposed to the chemical.
- Acute health hazards (affect the body quickly) versus chronic health hazards (exposure to material over long periods of time before there are any noticeable effects). Animal testing and reviewing long term human exposure to the materials identifies these hazards. The signs and symptoms include obvious physical indications and subjective complaints attributable to the exposure.
- Carcinogenicity, signs and symptoms of exposure, medical conditions generally aggravated by exposure.
- Emergency and first-aid procedures - immediate steps to take in the event of a medical emergency until a qualified medical professional can examine the victim.

## **Safe Handling and the Use of the Chemical**

- Steps to take in the event that the material is released or spilled.
- Appropriate waste disposal methods.
- Precautions to take in handling and storing the material.
- Other safety precautions.

## **Reducing Exposure**

- Engineering controls (the main form of defense against exposure) include:
  - Ventilation systems are of two types: local exhaust (captures and removes contaminants at the source) or general dilution type (reduces contamination levels by circulating fresh air throughout the work environments);
  - Special enclosures; and
  - Other mechanical protection systems.
  - Personal protective equipment - specific type of protective gloves, safety glasses, goggles, face shields, aprons, boots, and the exact type of respiratory equipment and materials needed for each individual chemical. Reminder: Personal protective equipment that is effective for one chemical may be entirely inappropriate for another.
- Appropriate work and hygienic practices.

## **Exposure Limits**

All the following measures must be listed (In some formats this is included under “Hazardous Ingredients”):

- OSHA permissible exposure limits (PEL) and short-term exposure limit (STEL);
- American Conference Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs); and
- Other exposure limits for the hazardous component.
- PELs and TLVs are time-weighted average (TWA) concentrations of the chemical in air, for a normal 8 hour work day and a 40 hour work week, to which nearly all workers may be repeatedly exposed without adverse effects.
- Units are commonly expressed as parts per million (ppm) or milligrams per cubic meter (mg/m<sup>3</sup>).