



## What Does an MSDS Tell You?

Manufacturers are required to provide a Material Data Sheet (MSDS) for each hazardous material purchased by PSU. The sheets must provide information on manufacturer's name and contact information, hazardous ingredients/identity information, physical/chemical characteristics, fire and explosion hazard data, reactivity data, health hazard data, safe handling and use, and control measures. Other information that may be provided includes first aid measures, disposal considerations, transport information, and regulatory information. Often the data is presented in technical terms that may require interpretation by the reader. The following should help in interpreting the information provided.

### **Hazardous ingredients:**

Not all ingredients may be listed if they are considered non-hazardous, are a minor component, or are considered a trade secret (trade secret material must be released to a physician if a person is exposed and injured).

### **Physical/chemical characteristics:**

This includes information such as color and form (gas, liquid, or solid) under normal conditions. Boiling point and freezing point may be listed here. Odor and odor detection levels may also be listed here.

### **Fire and explosion hazard data:**

This section includes information on flammable hazards that may include terms such as: Flammability: either combustible  $>100^{\circ}$  F flashpoint or flammable  $<100^{\circ}$  F flashpoint. The flashpoint is the temperature where a liquid produces enough vapor above it to be ignited. Lower Explosive Limit (LEL) of vapor in air. The LEL is the lowest vapor concentration of a material in air that can burn or explode.

### **Reactivity data:**

This section provides information on chemicals that are incompatible with the material on the MSDS. Air and water reactive materials can be very dangerous.

### **Health hazard data:**

Health hazard data is extracted from both human and animal research depending on the information available. At times the only information available may be toxicity data from test animals listed as Lethal Dose (LD) or Lethal Concentration (LC). The  $LD_{50}$  is the dose where half of the test population died in milligrams per kilograms (mg/kg).

<b>MSDS Value</b>	<b>Toxicity Rating</b>	<b>Adult Dose</b>
<1.0 mg/kg	Dangerously Toxic	A taste
1.0-50 mg/kg	Seriously Toxic	A teaspoon full
50-500 mg/kg	Highly Toxic	An ounce
.5-500 gm/kg	Moderately Toxic	A pint
5- 15 gm/kg	Slightly	A quart
>15 gm/kg	Low Toxicity	More than a quart

LC50: Concentration of a gas where half of the test population died, given in parts per million (ppm). The data will also list the time of exposure for the given effect.

Other health hazards may be listed, such as organs affected by exposure and any symptoms of exposure.

**Safe handling and use, and control measures:**

This section will list what recommended procedures or protective equipment is needed to safely use the material. Protective clothing and ventilation issues are usually addressed. Special handling and use precautions will also be noted here.

**First aid measures:**

First aid measures include steps to be taken if someone is accidentally exposed. This section will indicate whether or not to induce vomiting if the material is ingested or how to flush skin or eyes in case of contact. Always consult a physician if overexposure occurs that results in symptoms.

**Disposal considerations:**

This section will list any special disposal information. Do not follow recommendations for neutralization or treatment prior to disposal unless directed by EHS otherwise. Penn State will properly dispose of chemicals generated at the University without pretreatment by the user.

**Transport information:**

Any special labeling or packaging requirements for transport will be listed in this section.

**Regulatory information:**

Information on regulatory requirements such as spill reporting, or inventory reporting may be listed here. This material may not be up to date since these regulations change on an irregular basis.

Environmental Health and Safety is available to interpret MSDS information. We can access other more comprehensive sources for detailed information on the chemical or interpret technical information provided on the MSDS.