

MATERIAL SAFETY DATA SHEET USER'S GUIDE

INTRODUCTION

University employees handle, store, and use a variety of chemicals each day. In order to minimize the risk of chemical exposure to employees, it is important to understand how to protect yourself and what to do in the event of an emergency. A Material Safety Data Sheet (MSDS) provides the user with this information.

DOSH regulations specify the information that must be contained in a completed MSDS; however, the MSDS does not have to follow any set format. Consequently, the MSDSs received from various manufacturers may appear different. However, each must contain certain types of information.

The following information is intended to serve as a general guide to assist in the evaluation and understanding of a MSDS. This MSDS User's Guide is presented using the Occupational Safety and Health Administration (OSHA) form No. 174 (see Exhibit 1D) to describe data typically found in an MSDS and the general arrangement or location of data. An explanation of each section of the form follows.

SECTION I: PRODUCT IDENTIFICATION

General Comments:

The identity of the material must be included on the MSDS. This identity will usually be a systematic, scientific name, often with a unique Chemical Abstract Service (CAS) registry number. The product identity on the MSDS must match the identity on the label affixed to the chemical container.

Sometimes common synonyms are used for the products. Every known chemical designation or competitor's trade name is not necessarily listed.

Manufacturer's Name, Address, and Telephone Number

The manufacturer of the product is listed along with the manufacturer's address and telephone number for non-emergency information.

Emergency Telephone Number

The telephone number for information on the chemical in

emergency situations (spill, explosion, fire, or container leak).

Chemical Name and Synonyms

Refers to the chemical name of the material and any synonyms. Refers only to products consisting of a single element or compound, and not to mixtures.

Trade Name and Synonyms

The trade name (or name the product is sold by) is listed along with any synonyms.

Chemical Family

This indicates the general class of compounds to which a material belongs, such as ethers, acids, ketones, etc.

Formula

Refers to the chemical formula for single element or compound products.

Date Prepared

Date the MSDS was prepared or last revised.

SECTION II: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

General Comments:

The terms listed in this section should be those components in the product which individually meet any criteria for a defined hazardous substance. A component of a multi-component product might be listed based on its toxicity, flammability, reactivity, or combination of these. CAS numbers are not required to be listed under the Federal or Hawaii Hazard Communication Standard, but are required under California's Hazard Communication Standard.

Chemical Names

Names of the product's hazardous ingredients.

CAS Number

A unique identification number assigned to a chemical or product by the Chemical Abstract Service (CAS).

TLV

Threshold Limit Value (TLV) is a term used by the American Conference of Governmental Industrial Hygienists (ACGIH) to express the

airborne concentration of a material to which nearly all adults can be repeatedly exposed day-after-day without adverse effects.

PEL Permissible Exposure Limit (PEL) is an exposure limit established by OSHA's regulatory authority. The PEL may be a time-weighted average (TWA) or a maximum concentration exposure limit

Percent Describes the percent by weight or volume of each ingredients listed. The percentages of hazardous ingredients in a product may be given, but are not required in the present regulation.

SECTION III: PHYSICAL/CHEMICAL CHARACTERISTICS

General Comments:

The data in this section should be for the total mixture or product. The information provided in this section is useful for the control of toxic vapors and for designing proper ventilation systems.

Vapor Density Relative density or weight of a vapor or gas compared to the weight of an equal volume of air. Materials lighter than air will have vapor densities less than 1.0. Materials heavier than air will have vapor densities greater than 1.0.

Specific Gravity The ratio of the weight of a volume of materials to the weight of an equal volume of water.

Solubility in Water The percentage of a material that will dissolve in water at a specified temperature. Less than 0.1% considered negligible; 0.1% to 10% is moderate; more than 10% is appreciable and, if it can be dissolved in all proportions, it has complete solubility.

Vapor Pressure The pressure exerted by gas or vapor from the surface of the liquid in a closed container.

A high vapor pressure indicates that a liquid will evaporate easily.

Evaporation Rate The rate at which a material will evaporate when compared to a reference material (such as butyl acetate). If a substance has an evaporation rate greater than 1, it evaporates more easily than the reference material. If the rate is less than 1, it evaporates more slowly than the reference material.

Appearance and Odor The color, form, and other identifying features of the material, to help identify the substance.

Melting Point The temperature at which a solid changes to a liquid state.

Boiling Point The temperature at which a liquid changes to vapor state at a given pressure.

Percent Volatile by Volume Refers to the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature of 70 degrees Fahrenheit or 15.5 degrees Centigrade. This information may be found in place of melting point.

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

General Comments:

This section should contain the appropriate fire and explosion data for the product. If the product poses no fire hazard, a statement to that effect should be included in this section.

Flash Point (Method Used) The lowest temperature at which a liquid gives off enough vapor to form a ignitable mixture in air in a test container. Since flashpoints vary according to how they are obtained, the methods used are also listed. Tag Closed Cup (TCC), Penshymartens Closed Cup (PMCC), and Setaflash (SETA) methods are those used most extensively.

Flammable Limits When flammable vapors are mixed with air in the proportions, the mixture can be ignited by a spark or flame. The range of concentrations over which the flash will occur is

designated by the lower explosive limit (LEL) and the upper explosive limit (UEL). Flammable limits (explosive limits) are expressed in the percent by volume of vapor in air.

Extinguishing Media

The selection of fire extinguishing media is based on the type of chemical, its physical properties, and flammable characteristics. The most common types of extinguishing media are water, CO, dry chemical and foam.

Special Fire-fighting Procedures

Special handling procedures and personal protective equipment for fighting fires as applicable.

Special Fire-fighting Procedures and Precautions

General fire fighting methods are not described but special "exception to the rule" procedures are listed.

Unusual Fire and Explosion Hazards

Described are hazards associated with a chemical reaction or change in chemical composition which might occur under heat or fire conditions. Also described are hazards which may need to be considered while extinguishing fire with one of the available types of extinguishing media.

SECTION V: REACTIVITY DATA

General Comments:

This section relates to safe storage and handling of unstable hazardous substances. Essential information regarding the instability or incompatibility of the product to common substances or circumstances such as water, direct sunlight, metals used in piping, or containers, acids alkalies, etc. Under "Hazardous Decomposition Products", dangerous products created by aging should be included, like the production of peroxides in the decomposition of some ethers. The product's shelf life should also be indicated under this section when applicable.

Stability

An indication of the ability of the material to remain unchanged under reasonably foreseeable conditions. Conditions which may cause instability are stated.

<u>Incompatibility</u>	Common materials that could cause dangerous reactions when in contact with the product are listed.
<u>Hazardous Decomposition Products</u>	Hazardous products that may be produced when the material breaks down (by heat, chemical reaction, oxidation, decay, or other processes).
<u>Hazardous Polymerization</u>	Polymerization is a chemical reaction in which two or more small molecules combine to form larger molecules that contain repeating structural units of the original molecules. A hazardous polymerization is the above reaction with an uncontrolled release of energy.

SECTION VI: HEALTH HAZARD DATA

General Comments:

This section should be a combined estimate of the hazard of the total product. Severity of the effect of exposure and basis for the finding, such as animal or human studies may be included.

<u>Symptoms of Overexposure</u>	Physical signs of overexposure (inhalation, skin, or eye contact, absorption through the skin and ingestion).
---------------------------------	---

<u>Health Effects or Risks From Exposure</u>	Acute health effects which develop quickly from a single dose or short exposure to a substance are described. Chronic health effects which develop slowly over a long period of time, or recur frequently are also described.
--	---

<u>First Aid and Emergency Procedure</u>	First Aid procedures to follow until professional medical help is available in case of eye contact, skin contact swallowing, or breathing excessive amounts of the material are described.
--	--

<u>Suspect Cancer Agent</u>	This section states whether the product has been found to be a carcinogen (cancer causing agent) by any of the sources listed.
-----------------------------	--

<u>Medical Conditions Aggravated by Exposure</u>	Medical conditions which are aggravated by exposure to the material are listed.
--	---

Carcinogenicity

The product has the ability to produce cancer. A chemical or product is considered to be a carcinogen or potential carcinogen if it is listed in the International Agency for monographs, National Toxicology Program (NTP) report, or OSHA list of regulated carcinogens.

SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE

Spill and Leak Procedures

This describes methods for control and cleanup of spills or leaks. Appropriate materials, equipment, and personal protective equipment clothing are also listed.

Preparing Wastes for Disposal

Methods for packaging, neutralizing, or otherwise preparing waste product for disposal are described. Methods should be explicit, including proper labeling and handling of containers holding cleanup residue and specify acceptable disposal methods, such as sanitary landfill, incineration, etc.

SECTION VIII: CONTROL MEASURES

Ventilation and Engineering Controls

The type of ventilation which may be used is described. General exhaust removes contaminated air circulation or exchange system. Local captures and removes contaminants from the air at the point where the contaminants are released.

Respiratory Protection

Devices (respirators) for use in conditions exceeding exposure limits when properly selected, maintained, operated, and worn by the user, will protect the user's respiratory system from overexposure to air borne contaminants by inhalation.

Eye Protection

The type of eye protection needed for handling the product.

<u>Gloves</u>	The type and material of gloves to use for protection of skin.
<u>Other Clothing and Equipment</u>	Additional clothing or personal protective equipment which may be needed to prevent exposure to a material.
<u>Work/Hygienic Practices</u>	Any specific practices for working with the material are described.
<u>Other Handling and Storage Requirements</u>	Specific requirements for storing and handling the material described.
<u>Protective Measures During Maintenance of Contaminated Equipment</u>	Additional precautions for handling contaminated equipment.