



TEAMSTERS **Safety &** **Health** **FACTS**

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HOW TO READ A MATERIAL SAFETY DATA SHEET

Union members who work around chemicals frequently ask, "What is this stuff and what is it doing to me?" Employees are now protected by Right-to-Know laws, which require employers to supply workers with information on the identity of the chemicals they are exposed to, their health effects and training on how to handle them safely. In addition, all containers of hazardous materials must carry a warning label.

The details of these laws may differ from state to state, but they all require employees to have access to a Material Safety Data Sheet (MSDS) that contains information on health hazards, chemical ingredients, physical characteristics, control measures, and special handling procedures for all hazardous substances in the work area. The laws say that MSDS's must be readily accessible to all employees.

Because federal law requires all chemical manufacturers and distributors to produce and distribute MSDS's, even public employees who are not covered by a Right-to-Know law may still be able to obtain an MSDS from their employer or directly from the chemical manufacturer or distributor.

MSDS's must contain complete, accurate, and up-to-date information. It is illegal to have any blanks on the sheet. If no information exists, "no information" must be written in the space. Nevertheless, many MSDS's are inaccurate and incomplete, but may still be useful if you know how to read them and where to look for more information. Many states have agencies that will check the accuracy of MSDS's and the IBT Safety and Health Department can also assist you.

MSDS's may differ slightly in organization, but they must all contain the same basic information on hazardous ingredients, health effects, legal and recommended exposure limits, physical properties, and control methods.

Section I - Material Identification:

The name of the product as well as the name, address, and emergency telephone number of the manufacturer must be provided.

Section II - Hazardous Ingredients/Identity Information:

Which Chemicals are Covered?

State laws differ about which chemicals are required to be listed on an MSDS. Those states with laws similar to the Federal OSHA hazard communication standard require evaluation of all chemicals. The law covers all those found to be hazardous. Some states, however, require coverage of only the chemicals which have OSHA standards (about 500 chemicals). Other laws contain a list of thousands of chemicals that must be included, while a few require all ingredients to be listed, even those that are not hazardous. *Assume that all of the chemicals that you work with should be included unless the manufacturer or employer can prove otherwise.*

The percentage concentration of each substance in a mixture may be listed but, unfortunately, most state laws do not require this. It is useful, however, to know what other, "non-toxic" chemicals are in the mixture.

What are the Names of the Chemicals?

Chemicals are often known by different names:

- A trade name, such as "Safety Clean", is the brand name the manufacturer gives the product. It does not tell you what chemicals are in the product or whether the product is a mixture of chemicals or a single chemical. The same chemical may be used in a variety of products with different trade names. The trade name usually appears on the label and in Section I of the MSDS.
- A generic name describes a family or group of chemicals. For example, there are several different "isocyanates", and thousands of different "chlorinated hydrocarbons". Sometimes an MSDS will try to get away with just listing the generic names. However, the law says that chemical names must also be listed.
- The chemical or specific name is the one that describes the specific chemical. An example is methyl chloroform, one of the thousands of "chlorinated hydrocarbons", or toluene diisocyanate, a member of the "isocyanate" family. The chemical name is the easiest name to use when doing research on the health effects of chemicals and how to protect yourself.
- The CAS Number is assigned by the Chemical Abstract Service to each chemical. While different chemicals may have the same name, they will all have their own CAS number that can be used to look up information. The Chemical Abstract

Service publishes a book that contains a list of all CAS Numbers and the chemicals they represent.

The MSDS must list the chemical name of all hazardous ingredients that make up more than 1% of the mixture (or 0.1% for cancer-causing substances). Listing only the trade name, CAS number or generic name is not acceptable.

Trade Secrets

The manufacturer may be able to withhold ingredient information from the MSDS if any ingredients are trade secrets. Procedures for challenging a manufacturer's trade secret claim are determined by different state laws. Under most Right-to-Know laws, the manufacturer must provide the trade secret identities to health care professionals and/or workers if they have a need to know the information, or in a medical emergency. Consult your state law for more details. Remember that even if certain ingredients in the product are labeled as trade secrets, the MSDS must contain all of the other required information.

Exposure limits

The MSDS must list the OSHA Permissible Exposure Limit (PEL) for each hazardous ingredient and the Threshold Limit Values (TLVS) recommended by the American Conference of Governmental Industrial Hygienists. It may also list workplace exposure limits recommended by the National Institute for Occupational Safety and Health (NIOSH). These are important because ACGIH and NIOSH often recommend exposure limits that are more up-to-date and protective than OSHA'S.

Section III - Physical/Chemical Characteristics:

Physical and chemical characteristics include the chemical's appearance and odor, along with physical properties that indicate how easily a chemical will evaporate and release potentially harmful vapors into the air.

- ♦ **Boiling point:** The boiling point of a substance is the temperature at which the liquid boils or becomes a gas. The lower the boiling point, the quicker it evaporates and the easier it is to inhale. Chemicals with boiling points below 100°C (or 212°F) require special caution.
- ♦ **Vapor pressure:** A high vapor pressure indicates that a liquid will evaporate easily. Chemicals that evaporate quickly are called volatile. This means that air concentrations can build up quickly even though the substance is in liquid form. Liquids with high vapor pressures may be especially hazardous if you are working with them in a confined space or enclosed area.
- ♦ **Vapor density:** If the vapor density is less than one, it will tend to rise in air. If the vapor density is greater than one, it will fall in air and concentrate in the bottom of tanks or confined spaces, which could lead to a suffocating or explosive atmosphere.

- ♦ **Appearance and odor:** This information may help identify a substance that spills or leaks in your work area. However, many chemicals are hazardous at levels lower than they can be smelled. Also, many chemicals, such as hydrogen sulfide and ammonia, cause "olfactory fatigue", which means that workers rapidly lose their ability to smell the substance.
- ♦ **Specific gravity:** If the specific gravity is greater than one, the substance will sink in water; if less than one, it will float on top of water.
- ♦ **Evaporation rate:** This is the rate at which a substance evaporates compared to either ether, which evaporates quickly, or butyl acetate, which evaporates slowly. If the substance has an evaporation rate greater than one, it evaporates faster than the comparison substance.

Section IV - Fire and Explosion Hazard Data:

This section should provide information on the fire hazards of a product and special precautions necessary to extinguish a fire.

- ♦ **Flash point:** This is the lowest temperature at which a liquid gives off enough vapor to form a mixture with air that can be ignited by a spark. Liquids with flash points below 100°F are considered flammable, and liquids with flash points between 100° and 200°F are considered to be combustible. Flammable and combustible liquids require special handling and storage precautions.
- ♦ **Extinguishing media:** This section should specify what kind of fire extinguisher to use. There are four classifications of fires: Class A for paper and wood, Class B for more flammable materials such as liquids or greases, Class C for electrical fires, and Class D for fires involving metals or metal alloys.
- ♦ **Special fire fighting procedures and unusual fire and explosion hazards:** For example, some chemicals (such as corrosives) must not be extinguished with water in case of fire.

Section V - Reactivity Data:

When stored or handled improperly, some chemicals can react with other chemicals and release dangerous materials. This section describes the reaction of chemicals when they are mixed together with other chemicals, or when stored or handled improperly.

Section VI - Health Hazard Data:

This section describes the health effects of the product, including signs and symptoms of exposure and medical conditions made worse by exposure. Acute (short-term) and chronic (long-term) effects of exposure must always be included. MSDS's often leave out chronic health information, such as whether a chemical causes cancer or birth defects.

Routes of entry (inhalation, skin contact, swallowing) and emergency and first aid procedures must also be included. Unfortunately, a lot of MSDSs in circulation do not contain complete and accurate health hazard information.

This section must also contain information on target organs (liver, kidneys or central nervous system), signs or symptoms of exposure, medical conditions generally aggravated by exposure, and emergency first aid procedures.

Section VII - Precautions for Safe Handling and Use (Spill or Leak Procedures):

This section contains information on proper equipment to use and what precautions to follow if a spill or leak occurs. It should also describe safe waste disposal methods and precautions to be taken for handling and storing.

Section VIII - Control Measures:

The MSDS must list control measures that can reduce or eliminate the hazard including ventilation and other engineering controls, safe work practices, and personal protective equipment.

For respirators, information must be included on the type of respirator, degree of protection and the appropriate filter cartridge (such as acid gas, dust or organic vapor). Additionally, since all gloves do not protect against all chemicals, the correct type of glove should be specified on the MSDS.

CHECKING THE ACCURACY OF MSDS's:

What can be done if you suspect that the MSDS that you received is not accurate or complete?

- ♦ Ask your employer for an accurate, complete MSDS or to request one from the supplier or manufacturer.
- ♦ Contact the manufacturer through your union and ask for a more accurate MSDS.

- ♦ Call OSHA (state OSHA, if applicable) to check MSDS's and get more accurate information. Federal OSHA can also require a manufacturer to redo an MSDS if the information is inaccurate or incomplete.
- ♦ Call NIOSH on their toll-free number (800)-356-4674 for information about chemical identities, health effects or other information.
- ♦ Contact the IBT Safety and Health Department for the resources and knowledge needed to evaluate the accuracy and completeness of an MSDS.