ABOUT YOUR HOUSE

HOW TO READ A MATERIAL SAFETY DATA SHEET (MSDS)

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What is a Material Safety Data Sheet (MSDS)?

A Material Safety Data Sheet (MSDS) is an information sheet that lists the hazards, and safety and emergency measures related to specific products. An MSDS is required for certain industrial products used in the workplace like paint, caulking and cleaners. An MSDS is not required for consumer products, but may be available.

What is the Workplace Hazardous Materials Information System (WHMIS)?

The Workplace Hazardous Materials Information System (WHMIS) is legislation that states the following:

- A Material Safety Data Sheet (MSDS) must be provided to commercial users
- A hazard label must be attached to commercial products used in the workplace that contain substances above the pre-set limits controlled by WHMIS
- Workers using WHMIS-controlled products must receive training

Why would I use an MSDS?

You may want to know if there are chemicals in consumer products that can cause adverse health effects such as allergies or asthma. This information may be helpful if you are interested in preventing exposure to chemicals from new products or in finding out if existing products may be causing symptoms.

This guide describes Material Safety Data Sheets (MSDS) and other resources you can use to get related information. Resources are listed on the last page.

Where can I get an MSDS?

Suppliers are not required to provide you with an MSDS. However, you can ask them if they have one for a commercial product that is similar to your purchase. You may also obtain an MSDS from a data bank such as The Canadian Centre For Occupational Health and Safety.

The MSDS for many products are available online.

In an emergency situation your doctor can request an MSDS. If the product is required to have one, the supplier is obligated to provide it to the doctor.

Where can I get more information?

Some product labels include a full list of ingredients. Some suppliers will provide a full list if you request it. You can also ask the supplier's chemist for more information, including a list of additional ingredients.

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Are all ingredients included?

No. Only specific hazardous chemicals are required on an MSDS. **Thus, perfume or a chemical odorant that may not be considered hazardous may not show up in the MSDS. Manufacturers do not disclose information they consider proprietary. Such information may relate to the chemical composition.**

The MSDS lists each required substance that makes up more than 1 per cent of the product. However, if the chemical causes cancer, respiratory sensitization, or reproductive effects, then it must be listed if it makes up more than 0.1 per cent.

How much of a chemical is a problem?

It is important to consider several factors to determine if you should be concerned. For example, the quantity, toxicity and other effects, and the potential exposures of each chemical are important to think about. It is also important to know that most of the information on an MSDS relates to exposure to one chemical at a time. The information does not reflect exposure to the complex mixtures of chemicals found in a typical home. Also, most of the information on an MSDS was developed in relation to adult male exposures. Therefore, it may have little or no relevance to children, women or elevated risk populations.

Technical Terms

This guide uses simple language for convenience. You may need a chemical and a medical dictionary in order to understand a real MSDS. Listed below are some definitions of terms you may find on an MSDS.

Carcinogen: causes cancer

Hormonal: some chemicals act like hormones

Reproductive toxin: damages the male or female sex organs, sperm or eggs

Sensitization: a body response which makes you react to a smaller amount than before

Teratogen: causes developmental abnormalities to the fetus (unborn child)

Toxin/toxic: poison/poisonous

Guides to Reading an MSDS

Several organizations publish guides that are designed to help you understand an MSDS. Listed below are some examples.

The Industrial Accident Prevention Association (IAPA)

A Users Guide to MSDS

This is one of the easiest guides to read. It includes many good pictures to describe technical ideas.

The Canadian Centre For Occupational Health and Safety (CCOHS)

The Material Safety Data Sheet - A Basic Guide for Users

The Material Safety Data Sheet - An Explanation of Common Terms

A Typical MSDS

A faxed copy of an MSDS is often hard to read. It is best to get a copy from the Internet or have one mailed to you.

You may receive a nine-section MSDS as required in Canada, or a sixteen-section MSDS as required elsewhere. The information required, and where it is located in the document, is different on a nine- and sixteen-section MSDS. Suppliers develop their own MSDS's. Therefore, MSDS's may contain different information for the same product, chemical and section.

Very little data exists for some chemicals. However, the absence of health and environmental effects does not mean that there are none. It means either that there is no data on the chemical, or that the supplier did not feel it was important to include the chemical in the MSDS.

A Canadian MSDS would have the following nine sections.

Section 1: Product Information

This section includes:

- The product and/or trade name
- Product Identification Number (PIN)
- The chemical formula for required chemicals
- The manufacturer or supplier
- Addresses and phone numbers, including emergency phone numbers
- Descriptions of common or intended uses

Section 2: Hazardous Ingredients

This section typically includes:

- The names of the required hazardous ingredients
- Their percentages by weight or volume
- The Chemical Abstract System (CAS) numbers
- LD50(Lethal Dose) / LC50(Lethal Concentration) test results
- Occupational exposure limits: PEL (Permissible Exposure Levels and TLV (Threshold Limit Values)

Although there may be several names of an ingredient or chemical, each chemical is assigned a CAS number by the American Chemical Society.

LD50 (Lethal Dose) is the amount of the chemical, given all at once, that kills half a group of test animals. The chemical is administered dermally (by skin), by injection or by mouth. LC50 (Lethal Concentration) refers to the concentration which kills half of a test group of animals from a four-hour exposure by inhalation to the chemical in the air. LD50 is specific to the type of animal and the route of exposure. LC50 is also specific to the type of animal. LD50 and LC50 are expressed as weight of the chemical per kilogram of body weight of the animal and parts per million, respectively. The smaller the LD50 or LC50 values, the more toxic the chemical is. LD50 and LC50 provide a means of comparing the acute toxicity of different chemicals on the same animal type.

TLVs (Threshold Limit Values) are guidelines set by ACGIH (American Conference of Governmental Industrial Hygienists) to assist industrial hygienists in making decisions on safe exposure in the workplace. A TLV is the level of exposure that the typical healthy, adult worker can be exposed to without adverse effects. PEL is the maximum amount or concentration of a chemical that a worker may be exposed to under OSHA (Occupational Safety and Health Administration) regulations. A lower TLV or PEL means that less is allowed in the workplace air.

When deciding on a chemical to use, choose ones with higher TLVs or PELs. TLVs and PELs are not available for most chemicals. The absence indicates that the chemical has not gone through a rigorous and scientific peer review process that would permit conclusions on "safe" or "hazardous" exposure levels.

Section 3: Chemical and Physical Properties

This section includes information on the chemical and physical properties of the product.

- If it is a liquid, solid or vapour under stated conditions
- If it has a distinctive appearance or odour
- What its freezing and boiling points are
- If and how fast it will evaporate
- If it is an acid or base

Section 4: Fire and Explosion

This section describes how to prevent a fire or explosion while storing and using the product. It also recommends how to put out a fire, if there is one.

Section 5: Reactivity

This section tells you under which conditions dangerous chemical reactions can occur. This information explains how you can avoid dangerous mixtures and how to use appropriate storage methods.

Section 6:Toxicity

This section, also often presented as Health Hazard Data, includes information on acute (short-term) and chronic (long-term) health effects, signs and symptoms. It tells you if the product is irritating, or can cause sensitization, allergies, asthma, or cancer. It also tells you if the product can interfere with normal cell and organ development (developmental and reproductive effects), and if there are any effects that occur when this chemical is combined with others (additive and synergistic effects).

The information in this section is based on how the product would be used in a workplace setting. It also includes information on workplace exposure limits set by various regulatory agencies. Each exposure is related to the route of entry, which refers to how the chemical can enter your body. For instance, it may enter by skin or eye contact, through the lungs (inhalation) or stomach (by swallowing).

MSDS's usually do not include much information on some of the things consumers may be interested in, such as neurological (nerves and the brain), hormonal and cognitive (learning) effects.

This section may be less relevant for residential settings where long-term exposures to low doses and complex chemical mixes are more common. Also, since most of the information was developed in relation to adult male exposures, it may be less relevant in residential settings where at-risk populations such as children, the infirm and the elderly live.

Section 7: Prevention

This section tells you if you need to wear special clothing, or use ventilation and filter masks to protect yourself when using the product.

Section 8: First Aid

This section tells you what to do in an accident or emergency situation.

Section 9: Preparation

This section tells you who wrote the MSDS, their address and telephone number, and the date when it was written or last revised. An MSDS is valid for three years after it is produced or last revised.

Additional MSDS Information

There may be additional sections in an MSDS with more information on environmental effects. For example, information may include effects on birds, plants, animals and micro-organisms; recommended disposal and transportation methods; regulatory issues and miscellaneous data.

Other Information Sources for Chemical Ingredients

There are many sources of additional information, including The Canadian Chemical Producers Association, The Canadian Centre For Occupational Health and Safety, industry associations, universities, environmental organizations, federal and provincial ministries, the library and the Internet. As well, there are chemical, health and environmental indexes in the library, on disc or on the Internet.

Many databases are now on the Internet. If you do not have home or office access, your local library or educational institution can probably provide access to the Internet for you, even if you do not know how to operate a computer. Some Internet sites may charge a fee for services provided.

Users of MSDS report difficulty in understanding the chemical ingredients. One solution is to look up health information about each hazardous ingredient listed. Search the Internet and refer to websites operated by government agencies or universities. The Agency for Toxic Substances or Disease Registry with the U.S. Department of Health and Human Services (**http://www.atsdr.cdc.gov/toxpro2.html**) provides health information to prevent harmful exposures and disease related to toxic substances. Oxford University's Chemical and Other Safety Information (**http://physchem.ox.ac.uk/MSDS/**) is a good reference. Be aware, however, that the information for individual chemicals refers to their pure or concentrated state, whereas, the product may contain these chemicals as minor constituents only.

Based on the information obtained for each chemical, combined with the health hazard data or toxicity information from the product's MSDS, one can get an improved understanding of the nature of the substance one is dealing with.

When it is very important that the user knows as much of the product as possible, such as to find out ingredients that make up less than 1 per cent, or 0.1 per cent (such as cancer-causing or sensitizing chemicals), or to learn whether the product has perfumes or other substances, phone the manufacturer and ask to speak with the chemist or technical resource person.

A useful reference for consumer products is the National Institute of Health's Household Products Database (**http://householdproducts.nlm.nih.gov/products.htm**) which has compiled the potential health effects of brand name products from the manufacturers' MSDS and the individual product labels.

Resources

The following are typical examples of chemical and chemical effects resources. Some only list websites since information from these resources is primarily available through the Internet.

Art and Craft Material Institute
1280 Main St.
P.O. Box 479
Hanson, MA 02341
Phone: (781) 293-4100
Fax: (781) 294-0808

Canadian Centre for Occupational Health and Safety
Phone: 1 800 263-8466,
or (905) 570-8094
Fax: (905) 572-2206
E-mail: custserv@ccohs.ca
website: **http://www.ccohs.ca/**

Canadian Chemical Producers Hotline
Phone: 1 800 267-6666

Chemical Abstracts Service (CAS)
website: **http://info.cas.org/**

Chemport
website: **http://www.chemport.org/**

EPA, Indoor Air Quality Information Clearinghouse, Washington, D.C.
Phone: (703) 356-4020
Fax: (703) 356-5386
E-mail: iaqinfo@aol.com

Health Canada, Ottawa, Ontario
Phone: (613) 954-5995
Fax: (613) 952-7266
website: **http://www.hc-sc.gc.ca**

The Industrial Accident Prevention Association
Toronto, Ontario
Phone: (416) 506-8888
website:
http://www.iapa.ca/home/home.asp

Occupational Safety and Health Administration (OSHA),
Washington, D.C.
Phone: (202) 523-5181

Stanford University Chemical Safety website:
http://somsafety.stanford.edu/chemsafety/

University of Akron Abstract Service website:
http://ull.chemistry.uakron.edu/erd/

U.S. Environmental Protection Agency,
Washington, D.C.
Phone: (301) 585-9029
Fax: (301) 588-3408
website: **www.pollutiononline.com**

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