

How To Read a Material Safety Data Sheet

Hosea Hudson was worried about a new solvent his boss had provided him for cleaning parts. It smelled strong and made his eyes water with just a little whiff of it. Hosea and his union steward approached the boss. “Is this stuff safe?” the Steward asked. “How should I know,” the boss replied, “you can read about it for yourself.” Hosea and the Steward went over to where he was pointing and found a large manual full of sheets labeled “MSDS.” Now what to do?

What is an MSDS?

Federal law requires all manufacturers and importers of chemicals to thoroughly evaluate them and determine their hazard potential. If a chemical presents a hazard, a material safety data sheet (MSDS) must be developed to communicate the hazard potential to users. The MSDS must include not only the chemicals used, health and physical hazards associated with the chemicals; but special handling procedures; control measures; how the chemicals can affect you, whether from breathing them or skin exposure; what emergency measures to use; and how to contact the manufacturer in an emergency. The Occupational Safety and Health Administration (OSHA) requires that these MSDSs be available to all employees. All state safety laws also require that MSDSs be available for all employees who come under their jurisdiction.

How to Read an MSDS

Here is a summary of what information is contained in an MSDS, and an explanation of some of the abbreviations. Some sections will seem more important than others, like the section on “Hazard Identification,” but take the time to read the whole sheet. OSHA requires that all the following information must be on

each MSDS. However, each manufacturer may design their sheets in slightly different order or use slightly different titles for the sections.

1) Product and Company Identification

At the top of each MSDS the brand name of the product, the name and address of the manufacturer, and the telephone number for transportation emergencies must be provided.

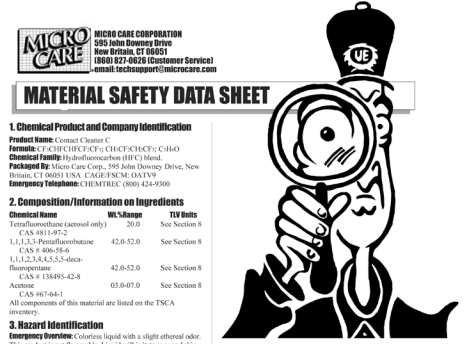
2) Composition/Information on Ingredients

This section provides the chemical and common names of the substances. Both active ingredients and inactive ingredients (something that just makes the chemical work better) must be listed along with their percentage of the total substance.

The CAS number is the Chemical Abstract Service identifying number. While different chemicals may have the same name, they will all have their own CAS number which can be used to look up further information.

3) Hazard Identification

Here is one of the most important sections for most workers. UE Stewards should familiarize themselves with the most common hazards presented by materials in their departments. The first part is an overview for emergency response personnel and the balance is a listing of potential adverse health effects arranged by route of entry. Route of entry means how the chemical enters the body. The most common ways are through inhalation (breathing); absorption through the skin, the eyes, and ingestion (swallowing it). If this material aggravates any conditions people might have, like asthma, then this too must be noted.



MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Identification
 Product Name: Contact Cleaner
 Formula: C₁₀H₁₂Cl₂CF₂; C₁₀H₁₂Cl₂CF₂; C₁₀H₁₂O
 Chemical Family: Hydrofluorocarbon (HFC) blend.
 Packaged By: Micro Care Corp., 595 John Downey Drive, New Britain, CT 06051 USA, CA#E1536, DA#179
 Emergency Telephone: CHEMTREC (800) 424-9300

2. Composition/Information on Ingredients

Chemical Name	Wt.%/Range	TLV Units
Tetrafluoroethane (aerosol only)	20.0	See Section 8
CAS # 811-97-2		
1,1,1,3,3-Pentafluorobutane	42.6-52.0	See Section 8
CAS # 406-06-6		
1,1,1,2,2,2,3,3,3-Nonafluoropropane	42.6-52.0	See Section 8
CAS # 134891-42-8		
Aerosol	03.6-07.9	See Section 8
CAS #67-66-1		

All components of this material are listed on the TSCA inventory.

3. Hazard Identification
Emergency Overview: Colorless liquid with a slight ethereal odor. This product is non-flammable. Liquid will irritate eyes and skin under repeated or prolonged exposure. Product vapors displace air and can cause asphyxiation especially in confined spaces.
Potential Health Effects:
Eye: Moderate irritation. Persons wearing contact lenses should wear chemical protective safety glasses when exposed to this product.
Skin: On repeated contact, dry and chapped skin, risk of chronic dermatitis.
Ingestion: Harmful if swallowed, irritating to the mouth, throat and stomach.
Inhalation: Inhalation of high concentrations of vapor is harmful and may cause head tingling, unconsciousness, or death. Intentional misuse or deliberate inhalation may cause death without warning.

Precautionary Statements: Use in well-ventilated areas. Avoid contact with skin and eyes. Use appropriate personal protective equipment (PPE).
Labels: See Section 9.
Regulatory Information: PEL (OSHA) None Established
 TLV (ACGIH) None Established
 I.L.E.L. (NIOSH) 1,1,1,2,2,2,3,3,3-Nonafluoropropane: 200 ppm, 8 & 12 hr; TWA
 PEL (OSHA) None Established
 TLV (ACGIH) None Established
 I.L.E.L. (NIOSH) 1,1,1,2,2,2,3,3,3-Nonafluoropropane: 200 ppm, 8 & 12 hr; TLV 400 ppm, AEL (DuPont)

4) First Aid Measures

This section includes advice on what to do if there is exposure to the chemical. What kind of eye wash to use, how to remove the chemical from contact with skin, what to do if the chemical gets swallowed, and what to do if it is inhaled. Again UE Stewards should take note of this section and check to see if the employer has the proper first aid facilities.

Remember, different chemicals might require different solutions for eyewashes, or for removal from the skin. The first aid station must have all the required types of eyewash available.

5) Fire Fighting Measures

This section details the potential for the material to catch on fire or explode. It also tells what if any additional hazards will incur if it burns or explodes, such as the creation of poisonous gases etc. The MSDS tells what materials should be used to put out a fire caused by or involving the product. It is good to check this section to make sure the employer has the required fire fighting equipment available.

6) Accidental Release Measures

This information concerns the dangers of a spill or leak and what actions to take.

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7) Handling and Storage

This section covers procedures to take to minimize the risks of accidental exposure, toxic decomposition of the product, or accidental release of the product. Should gloves be worn? Should there be a special ventilator where the chemical is used? Are there special requirements for the temperature? Are there other safe practices which need to be followed? Are there special instructions for cleaning clothes that are worn around the chemical? Any materials that must be kept separate from the hazardous material?

8) Exposure Controls/ Personal Protection

This section lists the protective measures needed to reduce the likelihood of toxic exposure through the eyes, skin, lungs or ingestion, but to be readable, the abbreviations need deciphering. AEL (Applicable Exposure Limit), TLV (Threshold Limit Value) and PEL (Permissible Exposure Limit) identify the maximum concentration of chemical in the air that a worker may be exposed to under OSHA regulations, ACGIH (American Conference of Governmental Industrial Hygienists) guidelines or those of other testing organizations.

STEL (Short Term Exposure Limit) is defined as the concentration to which workers can be exposed continuously for a SHORT period of time without suffering from irritation, chronic or irreversible tissue damage or narcosis. At NO TIME should exposure exceed a Ceiling value if there is one listed. TWA (Time Weighted Average) is the average value of exposure over the course of an 8 hour work shift. These values are almost always lower than Ceiling values.

9) Physical and Chemical Properties

Here all the physical and chemical characteristics of the hazardous substance are detailed. This provides some technical information concerning the boiling and freezing points of the chemicals; volatility (how easy it is to explode) and what it looks like and/or smells like. This information is important for determining safe usage of the material. If the MSDS says it has a low boiling point,

(the temperature at which it becomes a vapor) then perhaps the safest storage place is not next to the heating boilers! Ph values from 0 to 2 and 12 to 14 are usually corrosive to skin and eyes.

10) Stability and Reactivity

This information concerns the dangers of mixing this material with any other materials, what if anything will happen if it gets mixed with other chemicals, or water, etc.

11) Toxicological Information

This section describes the health effects of the chemical(s), including signs and symptoms of exposure and medical conditions made worse by exposure. Adverse health effects from both acute (short term) and chronic (long term) exposure must be included, however many MSDSs leave out the chronic health information, such as whether a chemical causes cancer or birth defects. The LD50 is the dose level which is expected to cause the death of 50% of the test animals and the LC50 is the concentration of dust, fume or mist this is expected to kill 50% of test animals.

The specific types of chemical health hazards the material presents should be listed. It should also identify exactly what organs it may attack, such as kidneys, livers, lungs etc. Included in this list of hazards might be:

- **Carcinogens** — chemicals that cause cancer.
- **Corrosives** — chemicals that eat away skin or membranes.
- **Toxins** — any substance said to accumulate in the body that is considered to be harmful or poisonous to the system.
- **Irritants** — any substance that causes a painful reaction from the body.
- **Sensitizers** — substances that induce sensitivity in a body so that further exposures trigger allergic reactions.
- **Mutagens** — chemicals that may change the genetic materials in a living cell.
- **Teratogens** — chemicals that may affect the ability to reproduce viable offspring or cause birth defects.

12) Ecological Data

This section describes the fish or wildlife that were used in toxicity testing, and the breakdown processes of a chemical when exposed to various environmental elements, such as sunlight or water.

13) Disposal Considerations

The directions and limitations for disposal of the material.

14) Transportation Information

The official shipping name and description, the number assigned for identification by the United Nations (UN) Convention, any special provisions and the DOT hazard class. The DOT recognizes 9 classes of hazardous materials. Typically the lower the number, the more hazardous the material.

15) Regulatory Information

The OSHA interpretation of the product's hazard to workers; the SARA (Superfund Amendment and Reauthorization Act) category; the TSCA (Toxic Substances Control Act) statement; the RCRA (Resource Conservation and Recovery Act) classification; and the CERCLA (Comprehensive Environmental Response, Compensation and Liability Act) classification.

16) Other Information

May list additional information such as the NFPA (National Fire Protection Association) ratings or an e-mail address for tech support, etc.

Some MSDS will also include information on how to clean up if there is a spill. It will tell what kind of material should be used in the cleanup and how to dispose of the material according to Environmental Protection Agency regulations, once it is cleaned up.

Trade Secrets

Manufacturers are not required to provide information on what they consider to be trade secrets, such as how their material is made, or exact component parts etc. BUT they must provide information on all chemicals used that are in any way hazardous to humans. In some cases they must provide exact information to health care providers treating a person who has been exposed to the hazardous chemical.