

Section 3

MSDS

What is a MSDS?

A Material Safety Data Sheet (MSDS) is an electronic and hardcopy document containing detailed and comprehensive information on hazards, precautionary and emergency information for a given hazardous material. The MSDS is meant to supplement the information contained in the Supplier or Workplace Label. It is prepared and supplied by the product's manufacturer; therefore MSDS's will vary in length, format and appearance.

An MSDS must be present for each hazardous material regulated under WHMIS and used in the workplace. A hardcopy of the MSDS must be located close to the work area and accessible to everyone who may be exposed. Suppliers must send a MSDS for every new controlled product they sell to the University and the purchaser must request a MSDS. A MSDS must not be more than three (3) years old from the date of preparation or revision.

In the event of an emergency, as in the case of an accident where a person requires medical attention due to overexposure of a controlled product, a copy of an MSDS should be provided to the attending medical personnel.

MSDS Contents

There are nine (9) categories of information which minimally must appear on the MSDS:

1. Product Information
2. Hazardous Ingredients
3. Physical Data
4. Fire and Explosion Data
5. Reactivity Data
6. Toxicological Properties
7. Preventative Measures
8. First Aid Measures
9. Preparation Information

1. Product Identification

SECTION 1 — Product Information

Product Identifier		WHMIS Classification (optional)	
Product Use			
Manufacturer's Name		Supplier's Name	
Street Address		Street Address	
City	Province	City	Province
Postal Code	Emergency Telephone	Postal Code	Emergency Telephone

This section gives you the information you need to ensure that the MSDS is the right one. The material is identified by trade name, brand name, code name or number specified by the supplier, chemical name, common name or generic name. The name found on the MSDS will be the same name that you will find on a supplier or workplace label. Other information includes:

- Manufacturer's Name, Address, Emergency Phone Number, Etc.
- Supplier's Name, Address, Emergency Phone Number, Etc.
- Product Use

2. Hazardous Ingredients

SECTION 2 — Hazardous Ingredients

Hazardous Ingredients (specific)	%	CAS Number	LD ₅₀ of Ingredient (specify species and route)	LC ₅₀ of Ingredient (specify species)

- **Hazardous Ingredients:** All of the potentially hazardous ingredients in the product and the toxicity will be listed here. The approximate amount (percentage) of each ingredient will also be stated. When a material contains ingredients that are registered as trade secret, a registration number assigned by the Hazardous Materials Information Review Commission will appear in place of the ingredients; hazards and safety information, however, must be reported. In the event of medical emergency the company must disclose the identity of the ingredients to a medical professional.
- **CAS Number:** The CAS registry number is a unique identification number assigned to each chemical by the Chemical Abstracts Service (CAS) Division of the American Chemical Society. This unique number can be used to confirm the chemical identity or obtain more information about the ingredient.
- **LD₅₀:** The LD₅₀ ("Lethal Dose 50") of an ingredient is the measure of acute lethality of the ingredient that, when administered in a single dose to a group of test animals by a defined route (oral or dermal) will cause death to 50% of the test population. The LD₅₀ values are expressed in milligrams per kilogram of the body weight, the lower the LD₅₀, the greater the toxicity.
- **LC₅₀:** The LC₅₀ ("Lethal Concentration 50") of an ingredient is the concentration of the ingredient in air which when inhaled by a group of test animals for a certain length of time (usually 4 hours), will kill 50% of those animals. LC₅₀ is expressed in parts of material per million parts of air by volume (ppm) for gases and vapours and as milligrams per cubic meter of air (mg/m³) for dusts and mists as well as for gases and vapours.

Both LD₅₀ and LC₅₀ are obtained from animal studies and the MSDS must indicate the species of animal tested and the route by which the hazardous ingredient was administered. Note that these values refer to pure ingredients. In a material, which is a mixture, the ingredients are present in the stated percentage concentration only.

3. Physical Data

SECTION 3 — Physical Data

Physical State	Odour and Appearance		Odour Threshold (ppm)
Specific Gravity	Vapour Density (air = 1)	Vapour Pressure (mmHg)	Evaporation Rate
Boiling Point (°C)	Freezing Point (°C)	pH	Coefficient of Water/Oil Distribution

This section describes the material and gives technical information on its properties.

- **Physical state** - solid, liquid or gas.
- **Odour and appearance** - what the chemical usually looks and smells like.
- **Odour threshold** - the lowest concentration of chemical that can be smelled.
- **pH** - a measure of the acidity or basicity (alkalinity) of a material when dissolved in water. It is a good indicator of the corrosive properties of the material.
- **Vapour pressure** - this is an indicator of the products ability to form vapours (i.e., products with a high vapour pressure can be extremely hazardous, particularly in confined spaces and unventilated areas).
- **Vapour density** - whether the chemical will rise or sink in air.
- **Evaporation rate** - how fast a material evaporates (i.e., the higher the evaporation rate, the more hazardous the product).
- **Boiling and freezing points** - indicates if the material will change its physical state at normal process temperature or room temperature.
- **Specific gravity** - reveals whether the material is likely to float or sink in water, and is useful in the planning of clean-up procedures and controls solubility in water.

4. Fire and Explosion Data:

SECTION 4 — Fire and Explosion Data

Flammability <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, under which conditions?	
Means of Extinction		
Flashpoint (°C) and Method	Upper Flammable Limit (% by volume)	Lower Flammable Limit (% by volume)
Autoignition Temperature (°C)	Explosion Data — Sensitivity to Impact	Explosion Data — Sensitivity to Static Discharge
Hazardous Combustion Products		

The purpose of this section is to describe the nature of the fire hazard of the material; i.e., potential to catch fire and explode. Information includes:

- **Flashpoint** - lowest temperature at which a liquid gives off enough vapour to ignite if an ignition source (such as spark) is present.
- **Exposure limits or Flammability range** - details about the minimum concentrations of vapours that will support combustion so you can prevent fires.
- **Auto-ignition temperature** - lowest temperature at which the chemical will ignite from its own heat source (no spark needed).
- **Hazardous combustion products** - dangerous chemicals which may be formed when a material burns.
- **Conditions of flammability** - indicates the conditions under which the material may be flammable.
- **Means of extinction** - the appropriate fire extinguishers for the material are identified in the section.
- **Explosion data** - describes whether or not the material presents an explosion hazard. Also indicates safe handling methods for these materials

5. Reactivity Data

SECTION 5 — Reactivity Data

Chemical Stability <input type="checkbox"/> Yes <input type="checkbox"/> No	If no, under which conditions?
Incompatibility with Other Substances <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, which ones?
Reactivity, and Under What Conditions?	
Hazardous Decomposition Products	

This section describes how stable the material is and any conditions, which can cause it to react dangerously.

- **Stability** - how likely it is that a chemical will decompose by itself, creating a dangerous situation.
- **Hazardous decomposition products** - what may be produced when the chemical reacts with other substances. Sometimes the product of a reaction is far more hazardous than the chemical itself.
- **Incompatibility with other substances** - materials which are incompatible may react violently or explosively if they are mixed or brought together. Such products should not be stored, mixed together or come in contact with each other.

6. Toxicological Properties

SECTION 6 — Toxicological Properties

Routes of Entry <input type="checkbox"/> Skin Contact <input type="checkbox"/> Skin Absorption <input type="checkbox"/> Eye Contact <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion	
Effects of Acute Exposure to Product	
Effects of Chronic Exposure to Product	
Exposure Limits (<i>value, source, date</i>)	Irritancy (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No
Sensitization (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No	Carcinogenicity (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No
Reproductive Toxicity (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No	Teratogenicity (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No
Mutagenicity (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No	Synergistic Products (<i>if yes, explain</i>) <input type="checkbox"/> Yes <input type="checkbox"/> No

This section describes the ways you can be exposed to the material and the potential harmful effects such exposure can have.

- **Routes of exposure** - how chemicals may enter the body (inhalation, absorption, and ingestion).
- **Effects of acute short-term exposure** - describes the health effects resulting immediately or a short time after an exposure, usually within 24 hours.
- **Effects of chronic long-term exposure** - describes the health effects resulting from repeated exposure to the material over long periods; (i.e., exposure to regular low doses of carbon monoxide over many years may initiate or aggravate heart problems).

- **Exposure limits** - refer to concentration of the substance in the air below which it is generally believed most people exposed to it will not be adversely affected.
- **Irritancy to product** - indicates whether the material will cause irritation to the eyes, nose, throat or skin, which provides important data for the selection of protective equipment.
- **Evidence of carcinogenicity, reproductive toxicity, teratogenicity or mutagenicity** - states whether the material has or is suspected of having any cancerous or reproductive effects.

7. Preventative Measures

SECTION 7 — Preventive Measures

Personal Protective Equipment	
<input type="checkbox"/> Gloves	<input type="checkbox"/> Respirator
<input type="checkbox"/> Eye	<input type="checkbox"/> Footwear
<input type="checkbox"/> Clothing	<input type="checkbox"/> Other
If checked, specify type	
Engineering Controls (<i>specify, such as ventilation, enclosed process</i>)	
Leak and Spill Procedure	
Waste Disposal	
Handling Procedures and Equipment	
Storage Requirements	
Special Shipping Information	PIN

This section provides information, which is used to develop a program for working safely with the material. Information includes:

- Personal Protective Equipment required to be worn to prevent overexposure
- Engineering controls e.g. details on required ventilation
- Safe handling and storage procedures
- Spillage clean-up and waste disposal procedures

8. First Aid Measure

SECTION 8 – First Aid Measures

Inhalation
Ingestion
Skin Contact
Eye Contact

This section describes actions to be taken immediately in case you are overexposed to the material. The purpose of first aid is to minimize injury and future disability. The time to know of these measures is before exposure occurs, so review/read this section before using the product.

9. Preparation Date and Group

SECTION 9 – Preparation Information

Prepared by (<i>group, department, etc.</i>)	Telephone Number	Preparation Date
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Names the person/group who prepared the MSDS, and its date of preparation.

MSDS Access Online @ OCAD U

1. OCAD University has a comprehensive Workplace Label and MSDS program online:

The screenshot shows the OCAD University website's Safety & Risk Management page. The navigation menu includes: ABOUT OCAD U, STUDENTS, PROSPECTIVE STUDENTS, ALUMNI, FACULTY, ACADEMIC PROGRAMS, RESEARCH, and LIBRARY. The main content area is titled 'OFFICE OF SAFETY & RISK MANAGEMENT' and includes sections for 'Health and Safety', 'Insurance and Risk', and 'Key Responsibilities'. A sidebar on the left contains a list of links under 'Safety & Risk Management Home', including 'MSDS ONLINE', which is circled in red. Other sidebar links include 'BUSINESS CONTINUITY PLAN', 'COLLEGE OF ART & DESIGN', and 'OCAD READY'. A 'HEADLINES' section on the right lists recent news items with dates and titles. A 'WHAT'S NEW' section at the bottom right provides information about WHMIS training and the MSDSOnline database.

2. MSDSonline home page:

The screenshot shows the MSDSonline home page. At the top, there is a 'Safety Center' header with a search bar labeled 'MSDS Search'. Below this, there are tabs for 'All Products', 'Locations', and 'Manufacturers'. The 'Locations' section is active, displaying a search bar with the placeholder text 'Enter Location Name' and a 'Search' button. Below the search bar, there is a checkbox labeled 'Show only locations with products'. The main content area displays a list of locations under the heading 'Level 1'. The locations are categorized into 'Art (451)', 'Design (578)', and 'Fabrication Studios (336)'. Each category has a list of sub-locations with their respective counts: Art includes Drawing & Painting (57), Integrated Media (53), Photography (159), Printmaking (144), and Sculpture and Installation/First Year (54); Design includes Ceramics (69), ED-ID (44), Fibre (98), and Jewellery (157); Fabrication Studios includes Foundry (113) and Metal (59).