

## You Have a “Right-to-Know”

The Occupational Safety and Health Administration (OSHA) created the Hazard Communication Standard (HAZCOM) with the intent to protect you from accidental contact with chemicals.

The standard provides you with the “Right-to-Know” about the chemicals you may encounter on the job and explains how to protect yourself from the hazards associated with these chemicals.

**OSHA Federal Register:  
29 CFR 1910.1200**

## Training Program Objectives

- Define the responsibilities of both employers and employees as they relate to Hazard Communication.
- Review and discuss typical hazards associated with chemicals.
- Provide an overview on how to understand the chemicals you work with by reviewing Safety Data Sheets and container labeling.



## The Employer’s Responsibilities

- It is the employer’s responsibility to develop a written Hazard Communication program.
- The company or employer must instruct employees on the standard and explain how it is implemented in the workplace.



## The Employee's Responsibilities

- Understand the chemicals you work with or encounter on a routine basis.
- Read and understand container labels and Safety Data Sheets (SDS).
- Notify your supervisor when you have doubts or concerns about the chemicals you work with.



## Chemicals are Common in the Workplace

- Liquid form
- Solid matter
- Gases
- Vapors
- Fumes
- Mists



*All potentially dangerous to the uneducated user!*

## Contact with Chemicals

- One in four employees comes into contact with chemicals every day.
- Two most typical routes of entry:
  - Absorption through the skin
  - Inhalation as you breathe
- Ingestion:
  - Proper hygiene is critical to preventing chemical ingestion.



## Chemical Health Hazards

- Producing reactions within the body.
- Chemicals that present health hazards include those containing:
  - Carcinogens (cause cancer)
  - Toxins
  - Reproductive toxins
  - Irritants
  - Corrosives
  - Sensitizers
- Health hazards can be **acute**: immediate or right away; or **chronic**: causing health problems over a long period of time.



## Chemical Properties

- Some chemicals are sensitive to sudden releases of pressure, which can cause them to expand violently, often resulting in an explosion:
  - Acetylene
  - Hydrogen
  - Argon
- These types of chemicals are stored in cylinders and it is important that they are stored correctly.



## Chemical Properties

- Chemicals labeled as "flammable" can catch fire easily and have a flash point below 100 ° F:
  - Gasoline
  - Lacquer Thinners
  - Alcohol
  - Acetone



## Chemical Properties

- The reactive properties of chemicals vary.
- When chemical reactions are not properly managed, they can have harmful or even catastrophic consequences.
- Reactive chemicals that should **NEVER** be mixed together include:
  - Alkali metals such as calcium, sodium and potassium with water
  - Acetic acid with chromic acid, nitric acid, and hydroxyl-containing compounds
  - Oxygen with oils, greases, hydrogen, flammable liquids, solids and gases
  - Bleach and ammonia, which creates chlorine gas



## Chemical Hazards

- With knowledge and proper work practices, chemicals can be used safely.
- It is critical that you follow established safe work procedures for chemicals in your facility:
  - Use chemicals properly—only for what they are intended.
  - Do not mix incompatible chemicals.
  - Use appropriate Personal Protective Equipment.
  - Practice good hygiene when using chemicals.



## Hazardous Chemical Inventory

- OSHA *now* defines a hazardous chemical as one that is a physical or health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified.
- A hazardous chemical inventory should be created and included in the written hazard communication program.
- Detailed, specific training should be completed for employees using chemicals reflected in the Hazardous Chemical inventory.



## Safe Work Procedures

- Before working with any chemicals, you must know how to read and understand the chemical's corresponding **Safety Data Sheet (SDS)** and the labeling provided on the chemical's container.



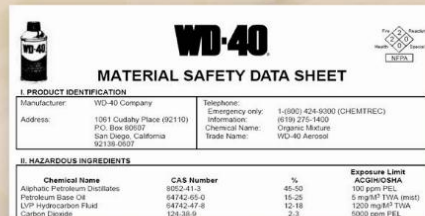
## Safe Work Procedures

- Manufacturers have a responsibility to disclose the physical and health hazards of each product they make.
- They are required to provide this information to users in the form of a:
  - Safety Data Sheet (SDS)
  - Properly labeled container



## Safety Data Sheet (SDS)

- Your primary tool for obtaining detailed information on the chemical.
- Should be readily available to everyone routinely exposed to that chemical.



# Safety Data Sheet (SDS)

- Provides details on chemicals, including:
  - Physical dangers
  - Safety procedures
  - Emergency response procedures
- Your employer must have one **Safety Data Sheet available in English for every chemical and hazardous product contained in your workplace.**
- A Safety Data Sheet provides all of the additional information that cannot be placed on an external container label.

## SDS Section 1: Identification

- The first section of the Safety Data Sheet describes the chemical's identity.
- This section will contain:
  - Name of chemical
  - Trade names
  - Name, address and telephone number of the manufacturer
- Other information may include:
  - Emergency telephone numbers
  - Department of Transportation (DOT) hazard class
  - Department of Transportation shipping name

### 1. Identification

**Product Name:** Chemical Stuff  
**Synonyms:** Methyltoxy Solution  
**CAS Number:** 000-00-0  
**Product Use:** Organic Synthesis  
**Manufacturer/Supplier:** My Company  
**Address:** My Street, Mytown, TX 00000  
  
**General Information:** 713-000-0000  
**Transportation Emergency Number:** CHEMTREC: 800-424-9300

## SDS Section 2: Hazard(s) Identification

- GHS classification of the chemical and any regional information.
- GHS label elements, including any precautionary statements.
- Other hazards which do not result in classification (e.g., dust explosion hazard) or are not covered by GHS.

2. Hazard Identification		
<b>GHS Classification</b>		
<b>Health</b>	<b>Environmental</b>	<b>Physical</b>
Acute Toxicity - Category 2 (inhalation); Category 3 (inhalation) Eye Corrosion - Category 1 Skin Corrosion - Category 1 Skin Sensitization - Category 1 Respiratory Sensitization - Category 1 Carcinogenicity - Category 2 Reproductive Toxicity - Category 2 Target Organ Toxicity (Respiratory) - Category 2	Acute Toxicity - Aquatic 2	Flammable Liquid - Category 2
<b>GHS Labels</b>		
<p><b>Signalword:</b> Harm, Irritant, Corrosive, Health Hazard</p> <p><b>Hazard Statements:</b>                      Highly Flammable Liquid and Vapor.                      P201+P202                      Causes severe skin burns and eye damage.                      May cause allergic skin reaction.                      Toxic if swallowed and in contact with skin.                      May cause drowsiness or dizziness.                      Suspected of causing genetic defects.                      May cause damage to reproductive, respiratory, nervous, and gastrointestinal systems and liver and blood through prolonged or repeated exposure.                      Toxic to aquatic life.</p> <p><b>Precautionary Statements:</b>                      Do not inhale dust or use otherwise when using this product.                      Do not breathe mist/vapors.                      Keep container tightly closed.                      Keep away from heat/spark/open flame. No smoking.                      Wear respiratory protection, protect in gloves and eye/face protection.                      Use only in a well-ventilated area.                      Take precautionary measures against static discharge.                      Do not empty into the sea.                      Store container tightly closed in cool well-ventilated place.                      Wash thoroughly after handling.</p>		

### SDS Section 3: Composition/Information on Ingredients

- The next section of the Safety Data Sheet covers **Composition/Information on ingredients**:
  - **Chemical Identity**
  - **Common Name, Synonyms, etc.**
  - **CAS number, EC number, etc.**
  - **Chemical identity and concentration of all hazardous ingredients in a mixture**

#### 3. Composition / Information on Ingredients

Component	CAS Number	Weight %
Methyltoxy	000-00-0	80

(See Section 8 for Exposure Limits)

### SDS Section 4: First-Aid Measures

- Description of necessary first aid measures, subdivided according to different routes of exposure.
- Most important symptoms and effects, both acute and delayed.
- Indication of immediate medical attention and special treatment needed, if necessary.

#### 4. First Aid Measures

**Eyes:** Eye irritation. Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get immediate medical attention.

**Skin:** Itching or burning of the skin. Immediately flush the skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Wash contaminated clothing before reuse.

**Inhalation:** Nasal irritation, headache, dizziness, nausea, vomiting, heart palpitations, breathing difficulty, cyanosis, tremors, weakness, red flushing of face, irritability. Remove exposed person from source of exposure to fresh air. If not breathing, clear airway and start cardiopulmonary resuscitation (CPR). Avoid mouth-to-mouth resuscitation.

**Ingestion:** Get immediate medical attention. Do not induce vomiting unless directed by medical personnel.

### SDS Section 5: Firefighting Measures

- Suitable and unsuitable extinguishing media.
- Specific hazards arising from the chemical.
- Special protective equipment and precautions for fire-fighters.

#### 5. Fire Fighting Measures

**Suitable Extinguishing Media:** Use dry chemical, foam, or carbon dioxide to extinguish fire. Water may be ineffective but should be used to cool fire-exposed containers, structures and to protect personnel. Use water to dilute spills and to flush them away from sources of ignition.

**Fire Fighting Procedures:** Do not flush down sewers or other drainage systems. Exposed firefighters must wear NIOSH-approved positive pressure self-contained breathing apparatus with full-face mask and full protective clothing.

**Unusual Fire and Explosion Hazards:** Dangerous when exposed to heat or flame. Will form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back. Vapors or gas may accumulate in low areas. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire. Vapors may concentrate in confined areas. Liquid will float and may reignite on the surface of water.

**Combustion Products:** Irritating or toxic substances may be emitted upon thermal decomposition. Thermal decomposition products may include oxides of carbon and nitrogen.

## SDS Section 6: Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures.**
- **Environmental precautions.**
- **Methods and materials for containment and cleaning up.**

### 6: Accidental Release Measures

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. (Also see Section 8).

Vapor protective clothing should be worn for spills and leaks. Shut off ignition sources; no flames, smoking or flames in hazard area. Small spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal. Large spills: Dike far ahead of liquid spill for later disposal.

Do not flush to sewer or waterways. Prevent release to the environment if possible. Refer to Section 15 for spill/release reporting information.

## SDS Section 7: Handling and Storage

- **Precautions for safe handling.**
- **Conditions for safe storage, including any incompatibilities.**

### 7: Handling and Storage

#### Handling

Do not get in eyes, on skin or on clothing. Do not breathe vapors or mists. Keep container closed. Use only with adequate ventilation. Use good personal hygiene practices. Wash hands before eating, drinking, smoking. Remove contaminated clothing and clean before re-use. Destroy contaminated belts and shoes and other items that cannot be decontaminated.

Keep away from heat and flames. Keep operating temperatures below ignition temperatures at all times. Use non-sparking tools.

#### Storage

Store in tightly closed containers in cool, dry, well-ventilated area away from heat, sources of ignition and incompatibles. Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Store at ambient or lower temperatures. Store out of direct sunlight. Keep containers tightly closed and upright when not in use. Protect against physical damage.

Empty containers may contain toxic, flammable and explosive residue or vapors. Do not cut, grind, drill, or weld on or near containers unless precautions are taken against these hazards.

## SDS Section 8: Exposure Controls

- **Control parameters (e.g., occupational exposure limit values).**
- **Appropriate engineering controls.**
- **Individual protection measures, such as personal protective equipment.**

### 8: Exposure Controls / Personal Protection

#### Exposure Limits

Component, Methylhexyl - TWA: 3 ppm (skin) - STEL: C 15 ppm (15 min.)

**Engineering Controls:** Local exhaust ventilation may be necessary to control air contaminants to their exposure limits. The use of local ventilation is recommended to control emissions near the source. Provide mechanical ventilation for confined spaces. Use explosion-proof ventilation equipment.

#### Personal Protective Equipment (PPE)

**Eye Protection:** Wear chemical safety goggles and face shield. Have eye-wash stations available where eye contact can occur.

**Skin Protection:** Avoid skin contact. Wear gloves impervious to conditions of use. Additional protection may be necessary to prevent skin contact including use of apron, face shield, boots or full body protection. A safety shower should be located in the work area. Recommended protective materials include butyl rubber and for limited contact Teflon.

**Respiratory Protection:** If exposure limits are exceeded, NIOSH approved respiratory protection should be worn. A NIOSH approved respirator for organic vapors is generally acceptable for concentrations up to 10 times the PEL. For higher concentrations, unknown concentrations and for oxygen deficient atmospheres, use a NIOSH approved air-supplied respirator. Engineering controls are the preferred means for controlling chemical exposures. Respiratory protection may be needed for non-routine or emergency situations. Respiratory protection must be provided in accordance with OSHA 29 CFR 1910.134.



## SDS Section 9: Physical and Chemical Properties

- Appearance
- Odor
- pH
- Melting/Freezing point
- Boiling point
- Flash point
- Evaporation rate
- Flammability
- Vapor pressure/density
- Solubility

### 9. Physical and Chemical Properties

Flashpoint: 2°C (35°F)

Autoignition Temperature: 480°C (896°F)

Boiling Point: 77°C (170.6°F) @ 760 mm Hg

Melting Point: -82°C

Vapor Pressure: 100.0 mm Hg @ 23°C

Vapor Density(Air=1): 1.7; air = 1  
% Solubility in Water: 10 @ 20°C

Pour Point: NA

Molecular Formula: Mixture

Odor/Appearance: Clear, colorless liquid with mild, pungent odor.

Lower Flammability Limit: >3.00%

Upper Flammability Limit: <15.00%

Specific Gravity: 0.82g/ml @ 20°C

% Volatile: 100

Evaporation Rate (Water=1): 5(Butyl Acetate =1)

Viscosity: 0.3 cP @ 25°C

Octanol/Water Partition Coefficient: log K<sub>ow</sub>: 0.5

pH: 7, 8% aqueous solution

Molecular Weight: Mixture

## SDS Section 10: Stability and Reactivity

- Chemical stability
- Possibility of hazardous reactions
- Conditions to avoid (e.g., static discharge, shock or vibration)
- Incompatible materials
- Hazardous decomposition products

### 10. Stability and Reactivity

Stability/Incompatibility: Incompatible with ammonia, amines, bromine, strong bases and strong acids.

Hazardous Reactions/Decomposition Products: Thermal decomposition products may include oxides of carbon and nitrogen.

## SDS Section 11: Toxicological Information

- Description of the various health effects:
  - Likely routes of exposure
  - Symptoms
  - Delayed and immediate effects, as well as chronic effects
  - Numerical measures of toxicity

### 11. Toxicological Information

Signs and Symptoms of Overexposure: Eye and nasal irritation, headache, dizziness, nausea, vomiting, heart palpitations, difficulty breathing, cyanosis, tremors, weakness, itching or burning of the skin.

#### Acute Effects:

Eye Contact: may cause severe conjunctival irritation and corneal damage.

Skin Contact: may cause reddening, blistering or burns with permanent damage. Harmful if absorbed through the skin. May cause allergic skin reaction.

Inhalation: may cause severe irritation with possible lung damage (pulmonary edema).

Ingestion: may cause severe gastrointestinal burns.

Target Organ Effects: May cause gastrointestinal (oral), respiratory tract, nervous system and blood effects based on experimental animal data. May cause cardiovascular system and liver effects.

Chronic Effects: based on experimental animal data, may cause changes to genetic material; adverse effects on the developing fetus or on reproduction at doses that were toxic to the mother. Methyltoly is classified by IARC as group 2B and by NTP as reasonably anticipated to be a human carcinogen, OSHA regulates Methyltoly as a potential carcinogen.

Medical Conditions Aggravated by Exposure: preexisting diseases of the respiratory tract, nervous system, cardiovascular system, liver or gastrointestinal tract.

#### Acute Toxicity Values

Oral LD<sub>50</sub> (Rat) = 100 mg/kg

Dermal LD<sub>50</sub> (Rabbit) = 225-300 mg/kg

Inhalation LC<sub>50</sub> (Rat) = 200 ppm/4 hr., 100 ppm vapor/1 hr

## Safety Data Sheet

- **Section 12 - Ecological Information**
- **Section 13 - Disposal Considerations**
- **Section 14 - Transport Information**
- **Section 15 - Regulatory Information**
- **Section 16 - Other Information**

### 12. Ecological Information

LC<sub>50</sub> (Fathead Minnow) = 9 mg/L/96 hr.

EC<sub>50</sub> (Daphnia) = 6.6 mg/L/48 hr.

Bioaccumulation is not expected to be significant. This product is readily biodegradable.

### 13. Disposal Considerations

As sold, this product, when discarded or disposed of, is a hazardous waste according to Federal regulations (40 CFR 261). It is listed as Hazardous Waste Number 2000, listed due to its toxicity. The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Refer to state and local requirements for any additional requirements, as these may be different from Federal laws and regulations. Chemical additions, processing or otherwise altering this material may make waste management information presented in the MSDS incomplete, inaccurate or otherwise inappropriate.

### 14. Transport Information

U.S. Department of Transportation (DOT)

Proper Shipping Name: Methylolacrylate

Hazard Class: 3.1

## Safety Data Sheet

- **It is vital that before working with any type of chemical, you:**
  1. **Know the location of the Safety Data Sheet for that chemical.**
  2. **Understand how to read the Safety Data Sheet.**
  3. **Practice the precautions listed on the Safety Data Sheet when working with that chemical.**

**Always consult your supervisor if you have any questions as to the location of the Safety Data Sheets or the information contained within them.**



## Container Labels

- **Reading the labeling on the chemical's container is another way for you to learn more about chemicals.**
- **Container labels do not provide the detail that is found on Safety Data Sheets.**
- **Container labeling will supply you with the following information:**
  - **The identity of the chemical**
  - **Appropriate hazard warnings**
  - **The name and address of the manufacturer or importer**

## Container Labels

- Warn you of the potential dangers of that chemical.
- They should never be the sole source of information on that chemical.
- Serve as an immediate warning to you as the user.

## Container Labels

- Chemicals transferred into a secondary container and stored:
  - Must be properly labeled with the product name and/or hazards
  - Include special precautions for handling (e.g., flammable, eye irritant)



## GHS Label Elements

- Symbols (hazard pictograms)- Convey health, physical and environmental hazard information.
- Signal Words- "Danger" or "Warning" are used to emphasize hazards:
  - "Danger" for more severe hazards
  - "Warning" for less severe hazards
- Hazard Statements – Standard phrases assigned to a hazard class and category.

## GHS Label Elements

- **Other GHS label elements include:**
  - **Precautionary Statements and Pictograms:** measures to minimize or prevent adverse effects.
  - **Product Identifier (ingredient disclosure):** Name or number used for hazardous product on a label or in the SDS.
  - **Supplier Identifications:** Name, address, and telephone number.
  - **Supplemental Information**

## GHS Symbols/Pictograms

Figure 4.9  
GHS Pictograms and Hazard Classes

<ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<ul style="list-style-type: none"> <li>• Flammables</li> <li>• Self Reactives</li> <li>• Pyrophorics</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Organic Peroxides</li> </ul>	<ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self Reactives</li> <li>• Organic Peroxides</li> </ul>
<ul style="list-style-type: none"> <li>• Acute toxicity (severe)</li> </ul>	<ul style="list-style-type: none"> <li>• Corrosives</li> </ul>	<ul style="list-style-type: none"> <li>• Gases Under Pressure</li> </ul>
<ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Respiratory Sensitizer</li> <li>• Reproductive Toxicity</li> <li>• Target Organ Toxicity</li> <li>• Mutagenicity</li> <li>• Aspiration Toxicity</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Toxicity</li> </ul>	<ul style="list-style-type: none"> <li>• Irritant</li> <li>• Dermal Sensitizer</li> <li>• Acute toxicity (harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract</li> <li>• Irritation</li> </ul>

## Example of a GHS Label

**ToxiFlam (Contains: XYZ)**

**Danger! Toxic If Swallowed, Flammable Liquid and Vapor**

Do not eat, drink or use tobacco when using this product. Wash hands thoroughly after handling. Keep container tightly closed. Keep away from heat/sparks/open flame. - No smoking. Wear protective gloves and eye/face protection. Ground container and receiving equipment. Use explosion-proof electrical equipment. Take precautionary measures against static discharge.

Use only non-sparking tools. Store in cool/well-ventilated place.

**IF SWALLOWED: Immediately call a POISON CONTROL CENTER or doctor/physician. Rinse mouth.**

**In case of fire, use water fog, dry chemical, CO<sub>2</sub>, or "alcohol" foam.**

See Material Safety Data Sheet for further details regarding safe use of this product.

MyCompany, MyStreet, MyTown NJ 00000, Tel: 444 999 9999

## Labeling Requirements

- Label must be legible and in good condition.
- For containers that may be hard to label, signs or placards may be used.
- Be sure that you are trained on the labeling system that your organization uses.



## Labeling Requirements



## Labeling Systems

- National Fire Protection Association (NFPA) system:
  - Color coded diamond
    - Health hazard = **BLUE**
    - Flammability = **RED**
    - Reactivity = **YELLOW**
    - Special precautions = **WHITE**
  - Numbering system
    - Scale of 0 to 4
    - 4 = most dangerous



## Labeling Systems

- Another commonly used and perfectly acceptable labeling system is known as the Hazardous Material Identification System or "HMIS."
- Color scheme follows the same that is used by the National Fire Protection Association:
  - **BLUE** = Health
  - **RED** = Flammability
  - **YELLOW** = Physical hazard/ reactivity
  - **WHITE** = Personal Protective Equipment

ACETONE	
<b>1</b>	Health
<b>3</b>	Flammability
<b>0</b>	Reactivity
<b>C</b>	Protective Equipment
<b>HAZARD RATING</b>	
4 EXTREME	1 SLIGHT
3 SERIOUS	0 MINIMAL
2 MODERATE	

## Your Responsibility

- It is your responsibility to read and understand container labeling and the appropriate Safety Data Sheets for the chemicals that you will work with.
- Helps you to take the necessary steps in protecting not only yourself, but also your co-workers.
- Ask your supervisor.



**Never leave chemical safety to chance!**

## Thank you

**If you have any questions, be sure to ask your Gallagher Bassett Loss Control Consultant.**



Gallagher Bassett Services, Inc.

Gallagher Bassett Services, Inc., Two Pierce Place, Itasca, IL 60143-3141  
800-984-8847 • [www.gbriskcontrol.com](http://www.gbriskcontrol.com)

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