

# ICS Chillers

Industrial Chiller Specialists, Inc.

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## Material Safety Data Sheet

### DOWTHERM SR-1 Ethylene Glycol

**Product: Dowtherm SR-1 Heat Transfer Fluid**

**Material Safety Data Sheet #: 40647**

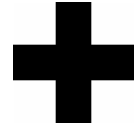
**Manufacturer: The Dow Chemical Company**



**24 Hour Emergency Phone: 989-636-4400**



# THE DOW CHEMICAL COMPANY MATERIAL SAFETY DATA SHEET



**Product Name:** DOWTHERM\* SR-1 Heat Transfer Fluid,  
Dyed  
**MSDS#:** 40647

**Effective Date:** 06/21/2002

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Dow (hereinafter, and for purposes of this MSDS only, refers to The Dow Chemical Company and to Dow Chemical Canada Inc.) encourages and expects you to read and understand the entire MSDS, as there is important information throughout the document. Dow expects you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### 1.1 IDENTIFICATION

**Product Name**      DOWTHERM\* SR-1 Heat Transfer Fluid, Dyed

### 1.2 COMPANY IDENTIFICATION

The Dow Chemical Company  
Midland, MI 48674

### 1.3 EMERGENCY TELEPHONE NUMBER

**24-HOUR EMERGENCY TELEPHONE NUMBER: (989)636-4400.**  
Customer Information Number: 1-800-258-2436.

\* or ® Indicates a Trademark of The Dow Chemical Company.

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## **2. COMPOSITION INFORMATION**

<b>Component</b>	<b>CAS #</b>	<b>Amount (%W/W )</b>
Ethylene glycol	107-21-1	> 95 %
Dipotassium hydrogen phosphate	7758-11-4	< 3%
Water	7732-18-5	< 3%

## **3. HAZARDS IDENTIFICATION**

### **3.1 EMERGENCY OVERVIEW**

**Appearance**      Pink

**Physical State**      Liquid

**Odor**      Sweet

**Hazards of product**      HARMFUL OR FATAL IF SWALLOWED.  
MAY CAUSE RESPIRATORY TRACT IRRITATION.

### **3.2 POTENTIAL HEALTH EFFECTS**

#### **Effects of Single Acute Overexposure**

**Inhalation**    At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache & nausea.

**Eye Contact**    May cause slight temporary eye irritation. Corneal injury is unlikely. Vapor or mist may cause eye irritation.

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**Skin Contact** Brief contact is essentially nonirritating to skin. Prolonged contact may cause slight skin irritation with local redness. May cause more severe response if skin is abraded (scratched or cut).

**Skin Absorption** Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin exposure to large quantities may result in the absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potentially lethal amounts.

**Swallowing** Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). In humans, expected to be moderately toxic if swallowed even though oral toxicity was low when tested in animals. May cause nausea or vomiting. May cause abdominal discomfort or diarrhea.

## Chronic, Prolonged or Repeated Overexposure

**Effects of Repeated Overexposure** Repeated excessive exposure may cause irritation of the upper respiratory tract. In humans, effects have been reported on the following organs: Central nervous system. Observations in humans include: Nystagmus (involuntary eye movement). In animals, effects have been reported on the following organs: Kidney, liver. Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies. Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.

**Other Effects of Overexposure** No information available.

See Section 11 for toxicological information and additional information about potential health effects.

## **3.3 POTENTIAL ENVIRONMENTAL EFFECTS**

See Section 12 for Ecological Information.

## **4. FIRST AID PROCEDURES**

### **4.1 INHALATION**

Move person to fresh air; if effects occur, consult a physician.

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## **4.2 EYE CONTACT**

Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

## **4.3 SKIN CONTACT**

Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Discard contaminated articles including leather items such as shoes.

## **4.4 SWALLOWING**

Do not induce vomiting. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240 ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (1/3-1/2 Cup) (90-120 ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounces (1 1/2 tsp) (8 ml) liquor for each 10 pounds of body weight, or 2 ml per kg body weight [e.g., 1.2 ounce (2 1/3 Tbsp) for a 40 pound child or 36 ml for an 18 kg child].

## **4.5 NOTES TO PHYSICIAN**

If several ounces of EG have been ingested, early administration of ethanol may counter the toxic effects (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis & thiamine 100 mg plus pyridoxine 50 mg IV every 6 hr.

If ethanol is used, a therapeutically effective blood concentration in the range of 100 - 150 mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment.

4-Methyl pyrazole (Antizol®) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol, di- or triethylene glycol, ethylene glycol butyl ether, or methanol intoxication if available.

Fomepizole protocol (Brent, J. et al., New England Journal of Medicine, Feb. 8, 2001, 344:6, p. 424-9): loading dose 15 mg/kg IV, follow by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15 mg/kg every 12 hours.

Continue fomepizole until serum methanol, EG, DEG, or TEG are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement.

Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress.

In severe poisoning, respiratory support with mechanical ventilation and positive end expiratory pressure may be required.

If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.

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## **5. FIRE FIGHTING MEASURES**

### **5.1 FLAMMABLE PROPERTIES - REFER TO SECTION 9, PHYSICAL AND CHEMICAL PROPERTIES**

### **5.2 EXTINGUISHING MEDIA**

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

### **5.3 FIRE FIGHTING PROCEDURES**

Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from a protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

### **5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS**

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

### **5.5 UNUSUAL FIRE AND EXPLOSION HAZARDS**

Container may rupture from gas generation in a fire situation.  
Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.  
Liquid mist of this product can burn.  
Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.

### **5.6 HAZARDOUS COMBUSTION PRODUCTS**

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

## **6. ACCIDENTAL RELEASE MEASURES**

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## **Steps to be Taken if Material is Released or Spilled:**

Small spills: Absorb with materials such as: cat litter. sawdust. vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. See Section 13, Disposal Considerations for additional information.

**Personal Precautions:** Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling for additional precautionary measures.

**Environmental Precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

## **7. HANDLING AND STORAGE**

### **7.1 HANDLING**

#### **General Handling**

Do not swallow.

Wash thoroughly after handling.

Avoid breathing vapor and mist.

Use with adequate ventilation.

Keep container closed.

See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

#### **Ventilation**

Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

#### **Other Precautions**

Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

### **7.2 STORAGE**

Do not store in opened or unlabeled containers. Do not store in: galvanized steel.

## **8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**

### **8.1 EXPOSURE LIMITS**

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**Component**

**Exposure Limits**

**Skin Form**

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Ethylene glycol	100 mg/m3 CEILING ACGIH 100 mg/m3 CEILING Interim IHG	Aerosol Aerosol and Vapor
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*In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.*

*A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.*

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"Interim IHGs" are occupational exposure limits set by the original owner of this product prior to the merger with Dow. These limits have not been reviewed per the Dow IHG process, but are utilized during this period of merger integration until Dow can formally adopt or modify.

## **8.2 PERSONAL PROTECTION**

- Respiratory Protection:** Atmospheric levels should be maintained below the exposure guideline.  
For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator.
- Ventilation:** Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.
- Eye Protection:** Use safety glasses.  
If exposure causes eye discomfort, use a full-face respirator.
- Other Protective Equipment:** When prolonged or frequently repeated contact could occur, use chemically protective clothing resistant to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on operation.  
If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures.  
When handling hot material, protect skin from thermal burns as well as from skin absorption.



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### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Liquid

**Appearance:** Pink

**Odor:** Sweet

**Flash Point - Closed Cup:** 111 °C 232 °F *Tag Closed Cup ASTM D 56* (Values for Ethylene Glycol)

**Flammable Limits In Air:**

Lower 3.2 %(V) *(for ethylene glycol)*  
Upper No test data available.

**Autoignition Temperature:** 398 °C 748 °F

**Vapor Pressure:** 2.2 mmHg 20 °C

**Boiling Point (760 mmHg):** 163 °C 325 °F

**Vapor Density (air = 1):** > 1.0

**Specific Gravity (H<sub>2</sub>O = 1):** 1.1295 60 °C / 60 °C

**Freezing Point:** *No test data available.*

**Melting Point:** *Not applicable (for liquids)*

**Solubility in Water (by weight):** 100 %

**pH:** *No test data available.*

### 10. STABILITY AND REACTIVITY

**10.1 STABILITY/INSTABILITY** Thermally stable at recommended temperatures and pressures.

**Conditions to Avoid:** Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

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**Incompatible Materials:** Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

**Thermal Decomposition:** Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers.

**10.2 HAZARDOUS POLYMERIZATION** Will not occur.

## **11. TOXICOLOGICAL INFORMATION**

### **ACUTE TOXICITY**

#### **Peroral**

Based on information for a similar material:  
Rat; LD50 = 8200 mg/kg

#### **Percutaneous**

Based on information for a similar material:  
Rabbit; LD50 (> 2000) mg/kg

### **DEVELOPMENTAL TOXICITY**

Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects., Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies.

### **REPRODUCTIVE TOXICITY**

Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.

### **CHRONIC TOXICITY AND CARCINOGENICITY**

Ethylene glycol did not cause cancer in long-term animal studies.

### **GENETIC TOXICOLOGY**

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## **In Vitro**

For the major component:, In vitro mutagenicity studies were negative.

## **In Vivo**

For the major component:, Animal mutagenicity studies were negative.

## **SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS**

Repeated excessive exposure may cause irritation of the upper respiratory tract.

In humans, effects have been reported on the following organs:

Central nervous system.

Observations in humans include:

Nystagmus (involuntary eye movement).

In animals, effects have been reported on the following organs:

Kidney, liver.

## **12. ECOLOGICAL INFORMATION**

### **12.1 ENVIRONMENTAL FATE**

Based largely or completely on information for: Ethylene glycol. Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

### **12.2 ECOTOXICITY**

Based largely or completely on information for:, Ethylene glycol., Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in most sensitive species tested).

### **12.3 FURTHER INFORMATION**

Based largely or completely on information for: Ethylene glycol. Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50).

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## **13. DISPOSAL CONSIDERATIONS**

### **13.1 DISPOSAL**

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/ Information On Ingredients). FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler. reclaimer. incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details .

## **14. TRANSPORT INFORMATION**

### **14.1 U.S. D.O.T.**

#### **NON-BULK**

**Proper Shipping Name :** NOT REGULATED

#### **BULK**

**Proper Shipping Name :** OTHER REGULATED SUBSTANCES, LIQUID, NOS

**Technical Name :** CONTAINS ETHYLENE GLYCOL

**Hazard Class :** 9

**ID Number :** NA3082

**Packing Group :** PG III

**Reportable Quantity :** 5,263 LB

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*This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.*

## **15. REGULATORY INFORMATION**

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### **15.1 FEDERAL/NATIONAL**

#### **OSHA HAZARD COMMUNICATION STANDARD**

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

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#### **SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTION 313**

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act 1986 and 40 CFR Part 372.

<b>Component</b>	<b>CAS #</b>	<b>Amount</b>
Ethylene glycol	107-21-1	> 95.0000 %

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#### **SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTION 302**

To the best of our knowledge this product does not contain chemicals at levels which require reporting under this statute.

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#### **SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTIONS 311 AND 312**

**Delayed (Chronic) Health Hazard :** Yes  
**Fire Hazard :** No  
**Immediate (Acute) Health Hazard :** Yes

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**Reactive Hazard :** No  
**Sudden Release of Pressure Hazard :** No

## TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

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## CEPA - DOMESTIC SUBSTANCES LIST (DSL)

This product contains one or more substances which are not listed on the Canadian Domestic Substances List (DSL). Contact your Dow representative for more information.

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## 15.2 STATE/LOCAL

### PENNSYLVANIA (WORKER AND COMMUNITY RIGHT TO KNOW ACT): PENNSYLVANIA HAZARDOUS SUBSTANCES LIST AND/OR PENNSYLVANIA ENVIRONMENTAL HAZARDOUS SUBSTANCE LIST:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

<b>Component</b>	<b>CAS #</b>	<b>Amount</b>
Ethylene glycol	107-21-1	> 95.0000 %

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### PENNSYLVANIA (WORKER AND COMMUNITY RIGHT TO KNOW ACT): PENNSYLVANIA SPECIAL HAZARDOUS SUBSTANCES LIST:

To the best of our knowledge this product does not contain chemicals at levels which require reporting under this statute.

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### CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

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## **CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1, LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)**

**VOC:** Not determined.

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*This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.*

## **16. OTHER INFORMATION**

### **16.1 ADDITIONAL INFORMATION**

Additional information on this and other Dow products may be obtained by visiting our web page at [www.dow.com](http://www.dow.com).

Additional information on this product may be obtained by calling Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada). Ask for a product brochure.

### **16.2 HAZARD RATING SYSTEM**

**NFPA ratings for this product are: H - 1      F - 1      R - 0**

*These ratings are part of a specific hazard communication program and should be disregarded where individuals are not trained in the use of this hazard rating system. You should be familiar with the hazard communication programs applicable to your workplace.*

### **16.3 RECOMMENDED USES AND RESTRICTIONS**

For industrial use.

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Dow recommends that you use this product in a manner consistent with the listed use. If your intended use is not consistent with Dow's stated use, please contact Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada) for more information.

## 16.4 REVISION

Version: 1.0

Revision: 06/21/2002

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

## 16.5 LEGEND

Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
IHG	Industrial Hygiene Guideline
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
R	Reactivity
TS	Trade secret
VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

*NOTICE: Dow urges each customer or recipient of this MSDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this MSDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given., Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that its activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of Dow, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product., Due to the proliferation of sources for information such as manufacturer-specific MSDSs, Dow is not and cannot be responsible for MSDSs obtained from any source other than Dow. If you have obtained a Dow MSDS from a non-Dow source or if you are not sure that a Dow MSDS is current, please contact Dow for the most current version.*