



# Material Safety Data Sheet

The Dow Chemical Company

**Product Name:** VORACOR™ CR 1124 SD Polyol

**Issue Date:** 12/04/2012

**Print Date:** 22 Jan 2013

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. Product and Company Identification

### Product Name

VORACOR™ CR 1124 SD Polyol

### COMPANY IDENTIFICATION

The Dow Chemical Company  
2030 Willard H. Dow Center  
Midland, MI 48674  
United States

Customer Information Number:

800-258-2436

### EMERGENCY TELEPHONE NUMBER

**24-Hour Emergency Contact:**

989-636-4400

**Local Emergency Contact:**

989-636-4400

## 2. Hazards Identification

### Emergency Overview

**Color:** Yellow

**Physical State:** liquid

**Odor:** Amine.

### Hazards of product:

CAUTION! May be harmful if inhaled. Vapor reduces oxygen available for breathing. May cause anesthetic effects. May cause central nervous system effects; may cause respiratory tract irritation. Keep upwind of spill. Contents under pressure.

### OSHA Hazard Communication Standard

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

### Potential Health Effects

**Eye Contact:** May cause slight temporary eye irritation. Corneal injury is unlikely.

**Skin Contact:** Prolonged contact may cause slight skin irritation with local redness.

**Skin Absorption:** Prolonged skin contact is unlikely to result in absorption of harmful amounts.

**Inhalation:** Prolonged excessive exposure may cause adverse effects. In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats).

**Ingestion:** Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Signs and symptoms of excessive exposure may include: May cause lacrimation (tears). Salivation. Convulsions. Tremors. Increased activity (hyperactivity).

**Aspiration hazard:** Based on physical properties, not likely to be an aspiration hazard.

**Effects of Repeated Exposure:** Contains component(s) which have been reported to cause effects on the following organs in humans: Kidney. Gastrointestinal tract. Contains component(s) which have been reported to cause effects on the following organs in animals: Liver. Heart.

**Birth Defects/Developmental Effects:** Diethylene glycol has caused toxicity to the fetus and some birth defects at maternally toxic, high doses in animals. Other animal studies have not reproduced birth defects even at much higher doses that caused severe maternal toxicity.

**Reproductive Effects:** Diethylene glycol did not interfere with reproduction in animal studies except at very high doses.

### 3. Composition Information

Component	CAS #	Amount
Polyester polyol	Trade secret	> 30.0 - < 60.0 %
1,1,1,3,3 - Pentafluoropropane	460-73-1	> 10.0 - < 30.0 %
Polyether polyols	Trade secret	> 7.0 - < 13.0 %
Polyethylene glycol	25322-68-3	> 3.0 - < 7.0 %
Glycerol	56-81-5	> 0.5 - < 1.5 %
Diethylene glycol	111-46-6	> 0.5 - < 1.5 %
Organic Phosphate	Trade Secret	> 1.0 %

### 4. First-aid measures

#### Description of first aid measures

**General advice:** First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

**Skin Contact:** Wash skin with plenty of water.

**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.

**Ingestion:** If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

#### Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

#### Indication of immediate medical attention and special treatment needed

Due to structural analogy and clinical data, this material may have a mechanism of intoxication similar to ethylene glycol. On that basis, treatment similar to ethylene glycol intoxication may be of benefit. In cases where several ounces (60 - 100 ml) have been ingested, consider the use of ethanol and hemodialysis in the treatment. Consult standard literature for details of treatment. 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 (EG), di- or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), 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 intravenously, 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, TEG or EGBE 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. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

## 5. Fire Fighting Measures

### Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

**Extinguishing Media to Avoid:** Do not use direct water stream. May spread fire.

### Special hazards arising from the substance or mixture

**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. Hydrogen halides.

**Unusual Fire and Explosion Hazards:** Container may rupture from gas generation in a fire situation. Blowing agent vaporizes quickly at room temperature. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

### Advice for firefighters

**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 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. 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. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

**Special Protective Equipment for Firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

## 6. Accidental Release Measures

**Personal precautions, protective equipment and emergency procedures:** Isolate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. Confined space entry procedures must be followed before entering the area. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

**Methods and materials for containment and cleaning up:** Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust. Collect in suitable and properly labeled containers. Wash the spill site with water. See Section 13, Disposal Considerations, for additional information.

## 7. Handling and Storage

### Handling

**General Handling:** Avoid contact with eyes. Avoid breathing vapor. Wash thoroughly after handling. Use with adequate ventilation. Keep container closed. Do not enter confined spaces unless adequately ventilated. This material is hygroscopic in nature. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

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

### Storage

Store in a dry place. Avoid prolonged exposure to heat and air. Protect from atmospheric moisture. Blowing agent may migrate from product and accumulate in some storage situations. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. Store in the following material(s): Carbon steel. Stainless steel. Polypropylene. Polyethylene-lined container. Teflon. Glass-lined container. Aluminum. Plasite 3066 lined container. Plasite 3070 lined container. 316 stainless steel. See Section 10 for more specific information.

**Storage Period:**

3 Months

**Storage temperature:**

19 - 24 °C

## 8. Exposure Controls / Personal Protection

### Exposure Limits

Component	List	Type	Value
1,1,1,3,3 - Pentafluoropropane	AIHA WEEL	TWA	1,644 mg/m <sup>3</sup> 300 ppm
Polyethylene glycol	AIHA WEEL	TWA Particulate.	10 mg/m <sup>3</sup>
Glycerol	ACGIH	TWA Mist.	10 mg/m <sup>3</sup>
	OSHA Table Z-1	PEL Respirable fraction.	5 mg/m <sup>3</sup>
	OSHA Table Z-1	PEL Total dust.	15 mg/m <sup>3</sup>
Diethylene glycol	AIHA WEEL	TWA	10 mg/m <sup>3</sup>

**Personal Protection**

**Eye/Face Protection:** Use safety glasses (with side shields).

**Skin Protection:** Wear clean, body-covering clothing.

**Hand protection:** Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Respiratory Protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

**Ingestion:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

**Engineering Controls**

**Ventilation:** Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

## 9. Physical and Chemical Properties

**Appearance**

<b>Physical State</b>	liquid
<b>Color</b>	Yellow
<b>Odor</b>	Amine.
<b>Odor Threshold</b>	No test data available
<b>pH</b>	No test data available
<b>Melting Point</b>	No test data available
<b>Freezing Point</b>	No test data available
<b>Boiling Point (760 mmHg)</b>	No test data available.
<b>Flash Point - Closed Cup</b>	> 100 °C (> 212 °F) Estimated.
<b>Evaporation Rate (Butyl Acetate = 1)</b>	No test data available
<b>Flammability (solid, gas)</b>	Not applicable to liquids
<b>Flammable Limits In Air</b>	<b>Lower:</b> No test data available <b>Upper:</b> No test data available
<b>Vapor Pressure</b>	23 psi @ 55 °C <i>Measured</i>
<b>Vapor Density (air = 1)</b>	No test data available
<b>Specific Gravity (H<sub>2</sub>O = 1)</b>	1.24 @ 23.88 °C/23.88 °C <i>ASTM D891</i>
<b>Solubility in water (by weight)</b>	Slightly soluble
<b>Partition coefficient, n-octanol/water (log Pow)</b>	No data available for this product. See Section 12 for individual component data.
<b>Autoignition Temperature</b>	No test data available
<b>Decomposition Temperature</b>	No test data available

<b>Dynamic Viscosity</b>	700 cps @ 25 °C <i>ASTM D4287</i>
<b>Kinematic Viscosity</b>	No test data available
<b>Explosive properties</b>	Not explosive
<b>Oxidizing properties</b>	No
<b>Molecular Weight</b>	No test data available

## 10. Stability and Reactivity

### Reactivity

No dangerous reaction known under conditions of normal use.

### Chemical stability

Stable under recommended storage conditions. See Storage, Section 7.

### Possibility of hazardous reactions

Polymerization will not occur by itself.

**Conditions to Avoid:** Product can oxidize at elevated temperatures. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. Generation of gas during decomposition can cause pressure in closed systems.

**Incompatible Materials:** Avoid contact with oxidizing materials. Avoid contact with: Strong acids. Strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

### Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon dioxide. Alcohols. Ethers. Hydrocarbons. Hydrogen halides. Ketones. Polymer fragments.

## 11. Toxicological Information

### Acute Toxicity

#### Ingestion

As product: Single dose oral LD50 has not been determined.

Based on information for component(s): Estimated. LD50, rat > 2,000 mg/kg

#### Dermal

As product: The dermal LD50 has not been determined.

Based on information for component(s): Estimated. LD50, rabbit > 2,000 mg/kg

#### Inhalation

As product: The LC50 has not been determined.

### Eye damage/eye irritation

May cause slight temporary eye irritation. Corneal injury is unlikely.

### Skin corrosion/irritation

Prolonged contact may cause slight skin irritation with local redness.

### Sensitization

#### Skin

No relevant data found.

#### Respiratory

No relevant data found.

### Repeated Dose Toxicity

Contains component(s) which have been reported to cause effects on the following organs in humans: Kidney. Gastrointestinal tract. Contains component(s) which have been reported to cause effects on the following organs in animals: Liver. Heart.

### Chronic Toxicity and Carcinogenicity

Diethylene glycol has been tested for carcinogenicity in animal studies and is not believed to pose a carcinogenic risk to man.

#### **Developmental Toxicity**

Diethylene glycol has caused toxicity to the fetus and some birth defects at maternally toxic, high doses in animals. Other animal studies have not reproduced birth defects even at much higher doses that caused severe maternal toxicity.

#### **Reproductive Toxicity**

Diethylene glycol did not interfere with reproduction in animal studies except at very high doses.

#### **Genetic Toxicology**

Contains component(s) which were negative in some in vitro genetic toxicity studies and positive in others. Genetic toxicity studies in animals were negative for component(s) tested.

## **12. Ecological Information**

### **Toxicity**

#### Data for Component: Polyester polyol

For similar material(s): Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

#### Data for Component: 1,1,1,3,3 - Pentafluoropropane

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

#### **Fish Acute & Prolonged Toxicity**

LC50, *Oncorhynchus mykiss* (rainbow trout), semi-static test, 96 h: > 100 mg/l

#### **Aquatic Invertebrate Acute Toxicity**

EC50, *Daphnia magna* (Water flea), static test, 48 h, immobilization: > 100 mg/l

#### Data for Component: Polyethylene glycol

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

#### **Fish Acute & Prolonged Toxicity**

LC50, *Pimephales promelas* (fathead minnow), static test, 96 h: > 10,000 mg/l

#### **Aquatic Invertebrate Acute Toxicity**

LC50, *Daphnia magna* (Water flea), 48 h: > 10,000 mg/l

#### Data for Component: Glycerol

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

#### **Fish Acute & Prolonged Toxicity**

LC50, *Pimephales promelas* (fathead minnow), static test, 96 h: >= 885 mg/l

#### **Aquatic Invertebrate Acute Toxicity**

LC50, *Daphnia magna* (Water flea), static test, 48 h: 1,955 mg/l

#### **Aquatic Plant Toxicity**

EC50, Other, static test, Growth inhibition (cell density reduction), 192 h: 2,900 mg/l

#### **Toxicity to Micro-organisms**

EC50, OECD 209 Test; activated sludge, 3 h: > 1,000 mg/l

#### Data for Component: Diethylene glycol

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

#### **Fish Acute & Prolonged Toxicity**

LC50, *Pimephales promelas* (fathead minnow), flow-through test, 96 h: 75,200 mg/l

#### **Toxicity to Micro-organisms**

EC50, OECD 209 Test; activated sludge, 3 h: > 1,000 mg/l

#### Data for Component: Organic Phosphate

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

**Fish Acute & Prolonged Toxicity**

LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 h: 84 mg/l

**Aquatic Invertebrate Acute Toxicity**

EC50, Daphnia magna (Water flea), 48 h, immobilization: 131 mg/l

**Aquatic Plant Toxicity**

ErC50, Pseudokirchneriella subcapitata (green algae), static test, Growth rate inhibition, 96 h: 82 mg/l

**Toxicity to Micro-organisms**

EC50, OECD 209 Test; activated sludge, Respiration inhibition, 3 h: 784 mg/l

**Aquatic Invertebrates Chronic Toxicity Value**

Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, NOEC: 32 mg/l

**Data for Component: Polyether polyol 1**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 &gt;100 mg/L in the most sensitive species tested).

**Fish Acute & Prolonged Toxicity**

LC50, Danio rerio (zebra fish), static test, 96 h: 6,310 mg/l

**Aquatic Invertebrate Acute Toxicity**

EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 9,890 mg/l

**Aquatic Plant Toxicity**

NOEC, Desmodesmus subspicatus (green algae), static test, biomass growth inhibition, 72 h: 100 mg/l

**Aquatic Invertebrates Chronic Toxicity Value**

Daphnia magna (Water flea), semi-static test, 21 d, mortality, NOEC: &gt;= 10 mg/l, LOEC: &gt; 10 mg/l

**Data for Component: Polyether polyol 2**

For this family of materials: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 &gt;100 mg/L in the most sensitive species tested).

**Fish Acute & Prolonged Toxicity**

For this family of materials: LC50, Leuciscus idus (Golden orfe), semi-static test, 96 h: &gt; 1,000 mg/l

**Aquatic Invertebrate Acute Toxicity**

For this family of materials: EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: &gt; 100 mg/l

**Aquatic Plant Toxicity**

For this family of materials: EC50, Desmodesmus subspicatus (green algae), static test, Growth rate inhibition, 72 h: &gt; 100 mg/l

**Aquatic Invertebrates Chronic Toxicity Value**

Daphnia magna (Water flea), semi-static test, 21 d, mortality, NOEC: &gt;= 10 mg/l, LOEC: &gt; 10 mg/l

**Persistence and Degradability****Data for Component: Polyester polyol**

No relevant data found.

**Data for Component: 1,1,1,3,3 - Pentafluoropropane**

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method	10 Day Window
8 %	28 d	OECD 301D Test	fail

**Indirect Photodegradation with OH Radicals**

Rate Constant	Atmospheric Half-life	Method
2.97E-14 cm <sup>3</sup> /s	360 d	Estimated.

**Theoretical Oxygen Demand:** 0.60 mg/mg**Data for Component: Polyethylene glycol**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.



**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method	10 Day Window
85 %	28 d	OECD 301F Test	pass

**Theoretical Oxygen Demand:** 1.67 mg/mg

**Data for Component: Glycerol**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method	10 Day Window
63 %	14 d	OECD 301C Test	Not applicable

**Theoretical Oxygen Demand:** 1.22 mg/mg

**Data for Component: Diethylene glycol**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% biodegradation in OECD test(s) for inherent biodegradability).

**OECD Biodegradation Tests:** Based on analogy.

Biodegradation	Exposure Time	Method	10 Day Window
90 - 100 %	20 d	OECD 301A Test	pass
82 - 98 %	28 d	OECD 302C Test	Not applicable

**Theoretical Oxygen Demand:** 1.51 mg/mg

**Data for Component: Organic Phosphate**

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

**OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method	10 Day Window
14 %	28 d	OECD 301E Test	fail
95 %	64 d	OECD 302A Test	Not applicable

**Indirect Photodegradation with OH Radicals**

Rate Constant	Atmospheric Half-life	Method
4.47E-11 cm <sup>3</sup> /s	0.24 d	Estimated.

**Theoretical Oxygen Demand:** 1.17 mg/mg

**Data for Component: Polyether polyol 1**

Based on information for a similar material: Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

**Data for Component: Polyether polyol 2**

For this family of materials: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. Material is ultimately biodegradable (reaches > 70% biodegradation in OECD test(s) for inherent biodegradability).

**OECD Biodegradation Tests:** For this family of materials: For this family of materials:

Biodegradation	Exposure Time	Method	10 Day Window
40 %	28 d	OECD 301B Test	fail
99 %	28 d	OECD 302B Test	Not applicable

**Bioaccumulative potential****Data for Component: Polyester polyol**

**Bioaccumulation:** No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

**Data for Component: 1,1,1,3,3 - Pentafluoropropane**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient, n-octanol/water (log Pow):** 1.35 Measured

**Data for Component: Polyethylene glycol**

**Bioaccumulation:** No bioconcentration is expected because of the relatively high water solubility.

Data for Component: **Glycerol****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient, n-octanol/water (log Pow):** -1.76 MeasuredData for Component: **Diethylene glycol****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient, n-octanol/water (log Pow):** -1.98 Estimated.**Bioconcentration Factor (BCF):** 100; Fish; MeasuredData for Component: **Organic Phosphate****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient, n-octanol/water (log Pow):** 2.59 Measured**Bioconcentration Factor (BCF):** 0.8 - 4.6; Cyprinus carpio (Carp); MeasuredData for Component: **Polyether polyol 1****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient, n-octanol/water (log Pow):** -3.38 - -3.25 Estimated.Data for Component: **Polyether polyol 2****Bioaccumulation:** No bioconcentration is expected because of the relatively high water solubility.**Mobility in soil**Data for Component: **Polyester polyol****Mobility in soil:** No data available.Data for Component: **1,1,1,3,3 - Pentafluoropropane****Mobility in soil:** Potential for mobility in soil is medium (Koc between 150 and 500).**Partition coefficient, soil organic carbon/water (Koc):** 280 Estimated.**Henry's Law Constant (H):** 6.89E-02 atm\*m3/mole; 25 °C Estimated.Data for Component: **Polyethylene glycol****Mobility in soil:** No data available.Data for Component: **Glycerol****Mobility in soil:** Potential for mobility in soil is very high (Koc between 0 and 50)., Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.**Partition coefficient, soil organic carbon/water (Koc):** 1 Estimated.**Henry's Law Constant (H):** 1.73E-08 atm\*m3/mole; 25 °C MeasuredData for Component: **Diethylene glycol****Mobility in soil:** Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50).**Partition coefficient, soil organic carbon/water (Koc):** < 1 Estimated.**Henry's Law Constant (H):** 7.96E-10 atm\*m3/mole; 25 °C Estimated.**Distribution in Environment: Mackay Level 1 Fugacity Model:**

Air	Water.	Biota	Soil	Sediment
0.75 %	99.25 %	0 %	0 %	0 %

Data for Component: **Organic Phosphate****Mobility in soil:** Potential for mobility in soil is slight (Koc between 2000 and 5000).**Partition coefficient, soil organic carbon/water (Koc):** 1,300 Estimated.**Henry's Law Constant (H):** < 1.35E-05 atm\*m3/mole; 25 °C Estimated.Data for Component: **Polyether polyol 1****Mobility in soil:** No data available.Data for Component: **Polyether polyol 2****Mobility in soil:** No data available.**13. Disposal Considerations**

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. AS YOUR SUPPLIER, WE HAVE

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: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section 10 Regulatory Information, MSDS Section 15

## 14. Transport Information

**DOT Non-Bulk**  
NOT REGULATED

**DOT Bulk**  
NOT REGULATED

**IMDG**  
NOT REGULATED

**ICAO/IATA**  
NOT REGULATED

*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

### OSHA Hazard Communication Standard

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

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

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

### 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.

Component	CAS #	Amount
Glycerol	56-81-5	> 0.5 - < 1.5 %
Diethylene glycol	111-46-6	> 0.5 - < 1.5 %

### 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.

### California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
Bischloroisopropyl Ether	108-60-1	< 125.0 PPM
Propylene oxide	75-56-9	< 15.0 PPM

### US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

### 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 sales or technical service representative for more information.

## 16. Other Information

### Product Literature

Additional information on this product may be obtained by calling your sales or customer service contact.

### Recommended Uses and Restrictions

#### Identified uses

Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

### Revision

Identification Number: 1064548 / 0000 / Issue Date 12/04/2012 / Version: 1.0

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

### Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

*The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS 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 his 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 the manufacturer, 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 (M)SDSs, we are not and*

*cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*