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**
Froth-Pak(TM) Sealant 620 HFC BF

**COMPANY IDENTIFICATION**
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI  48674
USA

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:** Characteristic

**Hazard of product:**

> **CAUTION!** May cause eye irritation. 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. Isolate area. 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 eye irritation. May cause slight temporary corneal injury.
- **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. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

**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 a component which is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions. Contains component(s) which have been reported to cause effects on the following organs in animals: Heart.

**Birth Defects/Developmental Effects:** Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.

**Reproductive Effects:** In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

### 3. Composition Information

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>811-97-2</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>Glycerol propylene oxide polymer</td>
<td>25791-96-2</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>Polyester polyol, aromatic</td>
<td>Not available</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>Sucrose, propylene oxide polymer</td>
<td>9049-71-2</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>Tris(1-chloro-2-propyl) phosphate</td>
<td>13674-84-5</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>1,1,1,3,3 - Pentafluoropropane</td>
<td>460-73-1</td>
<td>&gt;= 1.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>Triethyl phosphate</td>
<td>78-40-0</td>
<td>&gt;= 1.0 - &lt;= 5.0 %</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>&gt; 0.1 - &lt; 1.0 %</td>
</tr>
</tbody>
</table>

### 4. First-aid measures

**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.

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

**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.

**Ingestion:** Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

**Notes to Physician:** Maintain adequate ventilation and oxygenation of the patient. This material is a cholinesterase inhibitor. Treat symptomatically. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration. Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. Attempt seizure control with diazepam 5-10 mg (adults) intravenous over 2-3 minutes. Repeat every 5-10 minutes as needed. Monitor for hypotension, respiratory depression, and need for intubation. Consider second agent if seizures persist after 30 mg. If seizures persist or recur administer phenobarbital 600-1200 mg (adults) intravenous diluted in 60 ml 0.9% saline given at 25-50 mg/minute. Evaluate for hypoxia, dysrhythmia, electrolyte disturbance, hypoglycemia (treat adults with dextrose 100 mg intravenous). If exposed, plasma and red blood cell
cholinesterase tests may indicate significance of exposure (baseline data are useful). 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.

**Emergency Personnel Protection:** 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.

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### 5. Fire Fighting Measures

**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.

**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.

**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.

**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.

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### 6. Accidental Release Measures

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

**Personal Precautions:** Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard. 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.

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### 7. Handling and Storage

**Handling**

**General Handling:** Avoid contact with eyes. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. This material is hygroscopic in nature.
Contents under pressure. Do not puncture or incinerate container. Do not enter confined spaces unless adequately ventilated. 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 under cover in a dry, clean, cool, well ventilated place away from sunlight.

<table>
<thead>
<tr>
<th>Storage Period:</th>
<th>Storage temperature:</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Months</td>
<td>24 °C</td>
</tr>
</tbody>
</table>

### 8. Exposure Controls / Personal Protection

#### Exposure Limits

<table>
<thead>
<tr>
<th>Component</th>
<th>List</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>AIHA WEEL</td>
<td>TWA</td>
<td>4,240 mg/m³ 1,000 ppm</td>
</tr>
<tr>
<td>1,1,1,3,3 - Pentafluoropropane</td>
<td>AIHA WEEL</td>
<td>TWA</td>
<td>1,644 mg/m³ 300 ppm</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>ACGIH</td>
<td>Ceiling Aerosol</td>
<td>100 mg/m³</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Yellow</td>
</tr>
</tbody>
</table>
### Odor
- **Odor Threshold**: Characteristic
- **Flash Point - Closed Cup**: No test data available
- **Flammability (solid, gas)**: Not applicable to liquids
- **Flammable Limits In Air Lower**: No test data available
- **Autoignition Temperature**: No test data available
- **Vapor Pressure**: Not applicable
- **Boiling Point (760 mmHg)**: No test data available
- **Vapor Density (air = 1)**: No test data available
- **Specific Gravity (H2O = 1)**: 1.18 *Calculated*
- **Freezing Point**: No test data available
- **Melting Point**: No test data available
- **Solubility in water (by weight)**: No test data available
- **pH**: Not applicable
- **Decomposition Temperature**: No test data available
- **Partition coefficient, n-octanol/water (log Pow)**: No data available for this product. See Section 12 for individual component data.
- **Evaporation Rate (Butyl Acetate = 1)**: No test data available
- **Kinematic Viscosity**: 2,240 cSt *ASTM D4878*

### 10. Stability and Reactivity

**Stability/Instability**
Stable under recommended storage conditions. See Storage, Section 7.

**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 Polymerization**
Will not occur by itself.

**Thermal Decomposition**
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. Estimated. LD50, Rat > 2,000 mg/kg

**Dermal**
As product. The dermal LD50 has not been determined. Estimated. LD50, Rabbit > 2,000 mg/kg

**Inhalation**
As product. The LC50 has not been determined.

**Serious eye damage/eye irritation**
May cause slight eye irritation. May cause slight temporary corneal injury.
Skin corrosion/irritation
Prolonged contact may cause slight skin irritation with local redness.

Sensitization
Skin
No relevant information found.

Respiratory
No relevant information found.

Repeated Dose Toxicity
Contains a component which is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions. Contains component(s) which have been reported to cause effects on the following organs in animals: Heart.

Chronic Toxicity and Carcinogenicity
No relevant information found.

Developmental Toxicity
Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.

Reproductive Toxicity
In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

Genetic Toxicology
Genetic toxicity studies on tested components were predominantly negative. Contains component(s) which were negative in some animal genetic toxicity studies and positive in others.

12. Ecological Information

ENVIRONMENTAL FATE
Data for Component: 1,1,1,2-Tetrafluoroethane

Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is high (Koc between 50 and 150).

Henry's Law Constant (H): 5.00E-02 atm*m3/mole; 25 °C  Measured
Partition coefficient, soil organic carbon/water (Koc): 97  Estimated.

Persistence and Degradability
1,1,1,2-Tetrafluoroethane (HFC-134a) has a stratospheric ozone depletion potential (ODP) of zero, relative to CFC 12 (ODP=1). Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Indirect Photodegradation with OH Radicals
Rate Constant | Atmospheric Half-life | Method
---|---|---
6.20E-15 cm3/s | 1,700 d | Estimated.

OECD Biodegradation Tests:

<table>
<thead>
<tr>
<th>Biodegradation</th>
<th>Exposure Time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 %</td>
<td>28 d</td>
<td>OECD 301D Test</td>
</tr>
</tbody>
</table>

Theoretical Oxygen Demand: 0.47 mg/mg

Data for Component: Glycerol propylene oxide polymer

Movement & Partitioning
Based on information for a similar material: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).
Persistence and Degradability
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.

Data for Component: Sucrose, propylene oxide polymer

Movement & Partitioning
No bioconcentration is expected because of the relatively high water solubility.

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

Data for Component: Tris(1-chloro-2-propyl) phosphate

Movement & Partitioning
Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is low (Koc between 500 and 2000).

Henry's Law Constant (H): < 1.35E-05 atm*m3/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): 2.59 Measured

Partition coefficient, soil organic carbon/water (Koc): 1,300 Estimated.

Bioconcentration Factor (BCF): 0.8 - 4.6; common carp (Cyprinus carpio); Measured

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

Indirect Photodegradation with OH Radicals

<table>
<thead>
<tr>
<th>Rate Constant</th>
<th>Atmospheric Half-life</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.47E-11 cm3/s</td>
<td>0.24 d</td>
<td>Estimated.</td>
</tr>
</tbody>
</table>

OECD Biodegradation Tests:

<table>
<thead>
<tr>
<th>Biodegradation</th>
<th>Exposure Time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 %</td>
<td>28 d</td>
<td>OECD 301E Test</td>
</tr>
</tbody>
</table>

Theoretical Oxygen Demand: 1.17 mg/mg

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

Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3). Potential for mobility in soil is medium (Koc between 150 and 500).


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

Partition coefficient, soil organic carbon/water (Koc): 280 Estimated.

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

Indirect Photodegradation with OH Radicals

<table>
<thead>
<tr>
<th>Rate Constant</th>
<th>Atmospheric Half-life</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.97E-14 cm3/s</td>
<td>360 d</td>
<td>Estimated.</td>
</tr>
</tbody>
</table>

OECD Biodegradation Tests:

<table>
<thead>
<tr>
<th>Biodegradation</th>
<th>Exposure Time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 %</td>
<td>28 d</td>
<td>OECD 301D Test</td>
</tr>
</tbody>
</table>

Theoretical Oxygen Demand: 0.60 mg/mg

Data for Component: Triethyl phosphate

Movement & Partitioning
Bioconcentration potential is low (BCF < 100 or Log Pow < 3). 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.

Henry's Law Constant (H): 3.60E-08 atm*m3/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): 0.80 Measured

**Persistence and Degradability**

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

**Indirect Photodegradation with OH Radicals**

<table>
<thead>
<tr>
<th>Rate Constant</th>
<th>Atmospheric Half-life</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.794E-11 cm³/s</td>
<td>0.18 d</td>
<td>Estimated.</td>
</tr>
</tbody>
</table>

**Biological oxygen demand (BOD):**

<table>
<thead>
<tr>
<th></th>
<th>BOD 5</th>
<th>BOD 10</th>
<th>BOD 20</th>
<th>BOD 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Theoretical Oxygen Demand:** 1.58 mg/mg

**Data for Component:** Ethylene glycol

**Movement & Partitioning**

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

**Henry's Law Constant (H):** 8.05E-09 atm*m³/mole; 25 °C Estimated.

**Partition coefficient, n-octanol/water (log Pow):** -1.36 Measured

**Partition coefficient, soil organic carbon/water (Koc):** 1 Estimated.

**Distribution in Environment: Mackay Level 1 Fugacity Model:**

<table>
<thead>
<tr>
<th>Air</th>
<th>Water</th>
<th>Biota</th>
<th>Soil</th>
<th>Sediment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 %</td>
<td>98 %</td>
<td>&lt; 0.01 %</td>
<td>&lt; 0.01 %</td>
<td>&lt; 0.01 %</td>
</tr>
</tbody>
</table>

**Persistence and Degradability**

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

**Indirect Photodegradation with OH Radicals**

<table>
<thead>
<tr>
<th>Rate Constant</th>
<th>Atmospheric Half-life</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.32E-12 cm³/s</td>
<td>15 h</td>
<td>Estimated.</td>
</tr>
</tbody>
</table>

**OECD Biodegradation Tests:**

<table>
<thead>
<tr>
<th>Biodegradation</th>
<th>Exposure Time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 94 %</td>
<td>28 d</td>
<td>OECD 301F Test</td>
</tr>
<tr>
<td>90 %</td>
<td>1 d</td>
<td>OECD 302B Test</td>
</tr>
</tbody>
</table>

**Theoretical Oxygen Demand:** 1.29 mg/mg

**ECOTOXICITY**

**Data for Component:** 1,1,1,2-Tetrafluoroethane

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, rainbow trout (Oncorhynchus mykiss), static, 96 h: 450 mg/l

**Aquatic Invertebrate Acute Toxicity**

EC50, water flea Daphnia magna, 48 h, immobilization: 980 mg/l

**Data for Component:** Glycerol propylene oxide polymer

For this family of materials: 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:** Sucrose, propylene oxide polymer

Based on information for a similar material: 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:** Tris(1-chloro-2-propyl) 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, bluegill (Lepomis macrochirus), 96 h: 84 mg/l
**Aquatic Invertebrate Acute Toxicity**
EC50, water flea Daphnia magna, 48 h, immobilization: 63 mg/l

**Aquatic Plant Toxicity**
EC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), biomass growth inhibition, 96 h: 47 mg/l
EC50, alga Scenedesmus sp., biomass growth inhibition, 72 h: 45 mg/l

**Toxicity to Micro-organisms**
EC50, OECD 209 Test; activated sludge, respiration inhibition, 3 h: 784 mg/l

**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, rainbow trout (Oncorhynchus mykiss), static renewal, 96 h: > 100 mg/l

**Aquatic Invertebrate Acute Toxicity**
EC50, water flea Daphnia magna, static, 48 h, immobilization: > 100 mg/l

**Data for Component: Triethyl phosphate**
Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

**Fish Acute & Prolonged Toxicity**
LC50, Japanese medaka (Oryzias latipes), static, 48 h: > 500 mg/l

**Data for Component: Ethylene 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, rainbow trout (Oncorhynchus mykiss), static, 96 h: 18,000 - 46,000 mg/l

**Aquatic Invertebrate Acute Toxicity**
LC50, water flea Daphnia magna, static, 48 h: 46,300 - 51,100 mg/l

**Aquatic Plant Toxicity**
EC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), biomass growth inhibition, 96 h: 9,500 - 13,000 mg/l

**Toxicity to Micro-organisms**
EC50, OECD 209 Test; activated sludge, respiration inhibition, 30 min: 225 mg/l

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### 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

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### 14. Transport Information

**DOT Non-Bulk**
**Proper Shipping Name:** COMPRESSED GAS, N.O.S.
**Technical Name:** Fluorinated Hydrocarbons, Nitrogen
**Hazard Class:** 2.2 **ID Number:** UN1956
DOT Bulk
Proper Shipping Name: COMPRESSED GASES, N.O.S.
Technical Name: Fluorinated Hydrocarbons, Nitrogen
Hazard Class: 2.2  ID Number: UN1956

IMDG
Proper Shipping Name: COMPRESSED GASES, N.O.S.
Technical Name: Fluorinated Hydrocarbons, Nitrogen
Hazard Class: 2.2  ID Number: UN1956
EMS Number: F-C,S-V

ICAO/IATA
Proper Shipping Name: COMPRESSED GAS, N.O.S.
Technical Name: Fluorinated Hydrocarbons, Nitrogen
Hazard Class: 2.2  ID Number: UN1956
Cargo Packing Instruction: 200
Passenger Packing Instruction: 200

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: No
Fire Hazard: No
Reactive Hazard: No
Sudden Release of Pressure Hazard: Yes

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:
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 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.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1,4-Dioxane</td>
<td>123-91-1</td>
<td>&lt;= 0.016 %</td>
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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)**
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

### 16. Other Information

**Revision**
Identification Number: 1042556 / 0000 / Issue Date 03/09/2010 / Version: 1.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

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<tr>
<td>W/W</td>
<td>Weight/Weight</td>
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<tr>
<td>OEL</td>
<td>Occupational Exposure Limit</td>
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<tr>
<td>STEL</td>
<td>Short Term Exposure Limit</td>
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<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
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<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists, Inc.</td>
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<tr>
<td>DOW IHG</td>
<td>Dow Industrial Hygiene Guideline</td>
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<tr>
<td>WEEL</td>
<td>Workplace Environmental Exposure Level</td>
</tr>
<tr>
<td>HAZ DES</td>
<td>Hazard Designation</td>
</tr>
<tr>
<td>Action Level</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.