



# SAFETY DATA SHEET

## DDP SPECIALTY ELECTRONIC MATERIALS US, INC.

**Product name: Dow Brake Fluid 372LB**

**Issue Date: 10/15/2018**

**Print Date: 11/10/2018**

DDP SPECIALTY ELECTRONIC MATERIALS US, INC. 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.

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## 1. IDENTIFICATION

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**Product name:** Dow Brake Fluid 372LB

**Recommended use of the chemical and restrictions on use**

**Identified uses:** A brake fluid - For use in automotive applications.

**COMPANY IDENTIFICATION**

DDP SPECIALTY ELECTRONIC MATERIALS US,  
INC.  
400 ARCOLA ROAD  
COLLEGEVILLE PA 19426-2914  
UNITED STATES

**Customer Information Number:**

800-258-2436  
SDSQuestion@dow.com

**EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:** 1 800 424 9300

**Local Emergency Contact:** 800-424-9300

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## 2. HAZARDS IDENTIFICATION

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**Hazard classification**

GHS classification in accordance with 29 CFR 1910.1200  
Reproductive toxicity - Category 2

**Label elements**

**Hazard pictograms**



Signal word: **WARNING!**

**Hazards**

Suspected of damaging fertility or the unborn child.

**Precautionary statements****Prevention**

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response**

IF exposed or concerned: Get medical advice/ attention.

**Storage**

Store locked up.

**Disposal**

Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

No data available

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

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This product is a mixture.

Component	CASRN	Concentration
Triethylene glycol monomethyl ether	112-35-6	> 45.0 - < 55.0 %
Polyethylene glycol monomethyl ether	9004-74-4	> 10.0 - < 20.0 %
Triethylene glycol monobutyl ether	143-22-6	> 10.0 - < 20.0 %
Polyalkylene glycol monobutyl ether	9038-95-3	> 5.0 - < 15.0 %
Diethylene glycol monobutyl ether	112-34-5	< 10.0 %
Polyethylene glycol monobutyl ether	9004-77-7	< 5.0 %
Tetraethylene glycol monomethyl ether	23783-42-8	< 5.0 %
Diethylene glycol monomethyl ether	111-77-3	< 1.0 %
2-Piperazinoethanol	103-76-4	< 1.0 %

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## 4. FIRST AID MEASURES

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### 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 effects occur, consult a physician.

**Skin contact:** Wash off 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), any additional important symptoms and effects are described in Section 11: Toxicology Information.

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

**Notes to physician:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

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## 5. FIREFIGHTING MEASURES

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**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.

**Unsuitable extinguishing media:** 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. Combustion products may include trace amounts of: Nitrogen oxides.

**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.

#### 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. 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.

**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. If protective equipment is not available or not used, fight fire from a protected location or safe distance.

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal precautions, protective equipment and emergency procedures:** 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:** Small spills: Absorb with materials such as: Sand. Vermiculite. Collect in suitable and properly labeled containers. Large spills: Contain spilled material if possible. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

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## 7. HANDLING AND STORAGE

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**Precautions for safe handling:** Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

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

**Conditions for safe storage:** Store in the following material(s): Carbon steel. Stainless steel. Phenolic lined steel drums. Do not store in: Aluminum. Copper. Galvanized iron. Galvanized steel.

**Storage stability**

**Storage temperature:**  
10 - 35 °C (50 - 95 °F)

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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**Control parameters**

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value/Notation
Diethylene glycol monobutyl ether	ACGIH	TWA Inhalable fraction and vapor	10 ppm

Diethylene glycol monomethyl ether	Dow IHG	TWA	10 ppm
	Dow IHG	TWA	SKIN

**Exposure controls**

**Engineering controls:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

**Individual protection measures**

**Eye/face protection:** Use safety glasses (with side shields).

**Skin protection**

**Hand protection:** Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). 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.

**Other protection:** Wear clean, body-covering clothing.

**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, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Appearance**

<b>Physical state</b>	Liquid.
<b>Color</b>	Colorless to yellow
<b>Odor</b>	Ether
<b>Odor Threshold</b>	No test data available
<b>pH</b>	9.3 <i>FMVSS 116</i>
<b>Melting point/range</b>	No test data available
<b>Freezing point</b>	No test data available
<b>Boiling point (760 mmHg)</b>	253 °C ( 487 °F) <i>FMVSS 116</i> Equilibrium Reflux Boiling Point, dry 150 °C ( 302 °F) <i>FMVSS 116</i> Equilibrium Reflux Boiling Point, wet No test data available
<b>Flash point</b>	<b>closed cup</b> 146 °C ( 295 °F) <i>ASTM D92</i>
<b>Evaporation Rate (Butyl Acetate = 1)</b>	No test data available

<b>Flammability (solid, gas)</b>	No
<b>Lower explosion limit</b>	No test data available
<b>Upper explosion limit</b>	No test data available
<b>Vapor Pressure</b>	No test data available
<b>Relative Vapor Density (air = 1)</b>	No test data available
<b>Relative Density (water = 1)</b>	No test data available
<b>Water solubility</b>	No test data available
<b>Partition coefficient: n-octanol/water</b>	No data available
<b>Auto-ignition temperature</b>	No test data available
<b>Decomposition temperature</b>	No test data available
<b>Dynamic Viscosity</b>	No test data available
<b>Kinematic Viscosity</b>	2.2 mm <sup>2</sup> /s <i>Literature</i>
<b>Explosive properties</b>	No test data available
<b>Oxidizing properties</b>	No test data available
<b>Molecular weight</b>	No data available
<b>Volatile Organic Compounds</b>	No test data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** No data available

**Chemical stability:** Stable under recommended storage conditions. See Storage, Section 7.

**Possibility of hazardous reactions:** Polymerization will not occur.

**Conditions to avoid:** Do not distill to dryness. Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

**Incompatible materials:** Avoid contact with: Strong acids. Strong oxidizers.

**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: Aldehydes. Ketones. Organic acids.

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## 11. TOXICOLOGICAL INFORMATION

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*Toxicological information appears in this section when such data is available.*

### Acute toxicity

#### Acute oral toxicity

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.

Single dose oral LD50 has not been determined.

**Acute dermal toxicity**

Prolonged skin contact is unlikely to result in absorption of harmful amounts.  
The dermal LD50 has not been determined.

**Acute inhalation toxicity**

At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous.  
The LC50 has not been determined.

**Skin corrosion/irritation**

Brief contact is essentially nonirritating to skin.

**Serious eye damage/eye irritation**

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

**Sensitization**

For skin sensitization:  
No relevant data found.

For respiratory sensitization:  
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Available data are inadequate to determine single exposure specific target organ toxicity.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

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

**Carcinogenicity**

No relevant data found.

**Teratogenicity**

In animals, diethylene glycol methyl ether is slightly toxic to the fetus at doses nontoxic to the mother following skin contact; birth defects have been seen only following high oral doses which have little relevance to human exposure. Contains component(s) which did not cause birth defects in animals; other fetal effects occurred 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.

**Mutagenicity**

For the component(s) tested: In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

**Aspiration Hazard**

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

**COMPONENTS INFLUENCING TOXICOLOGY:**

**Triethylene glycol monomethyl ether**

**Acute oral toxicity**

LD50, Rat, 10,500 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, 7,100 mg/kg

**Acute inhalation toxicity**

Rat, 8 Hour, vapour, No deaths occurred following exposure to a saturated atmosphere.

**Polyethylene glycol monomethyl ether**

**Acute oral toxicity**

Typical for this family of materials. LD50, Rat, > 4,000 mg/kg Estimated. No deaths occurred at this concentration.

**Acute dermal toxicity**

Typical for this family of materials. LD50, Rabbit, > 17,460 mg/kg Estimated.

**Acute inhalation toxicity**

The LC50 has not been determined.

**Triethylene glycol monobutyl ether**

**Acute oral toxicity**

LD50, Rat, 5,170 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, 3,540 mg/kg

**Acute inhalation toxicity**

As product: The LC50 has not been determined.

**Polyalkylene glycol monobutyl ether**

**Acute oral toxicity**

LD50, Rat, 8,639 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, > 8,000 mg/kg

**Acute inhalation toxicity**

LC50, Rat, 4 Hour, dust/mist, > 5.01 mg/l No deaths occurred at this concentration.

**Diethylene glycol monobutyl ether**

**Acute oral toxicity**

LD50, Mouse, 2,410 mg/kg

LD50, Rat, 3,305 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, 2,764 mg/kg

**Acute inhalation toxicity**



The LC50 has not been determined.

**Polyethylene glycol monobutyl ether**

**Acute oral toxicity**

Single dose oral LD50 has not been determined.

Based on information for a similar material: May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. May cause dizziness and drowsiness. LD50, Rat, 2,630 mg/kg

**Acute dermal toxicity**

Based on information for a similar material: LD50, Rabbit, 3,540 mg/kg

The dermal LD50 has not been determined.

**Acute inhalation toxicity**

As product: The LC50 has not been determined.

**Tetraethylene glycol monomethyl ether**

**Acute oral toxicity**

LD50, Rat, > 10,500 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, 7,100 mg/kg Estimated.

**Acute inhalation toxicity**

As product: The LC50 has not been determined.

**Diethylene glycol monomethyl ether**

**Acute oral toxicity**

LD50, Mouse, 7,128 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, 9,404 mg/kg

**Acute inhalation toxicity**

The LC50 value is greater than the Maximum Attainable Concentration. LC0, Rat, 6 Hour, vapour, > 1.2 mg/l No deaths occurred at this concentration.

**2-Piperazinoethanol**

**Acute oral toxicity**

LD50, Rabbit, 3,350 mg/kg

**Acute dermal toxicity**

LD50, Rabbit, > 5,300 mg/kg

**Acute inhalation toxicity**

At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material may cause respiratory irritation and other effects.

As product: The LC50 has not been determined.

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## 12. ECOLOGICAL INFORMATION

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*Ecotoxicological information appears in this section when such data is available.*

### Toxicity

#### Triethylene glycol monomethyl ether

##### **Acute toxicity to fish**

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).  
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 5,000 mg/l, OECD Test Guideline 203 or Equivalent

##### **Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 500 mg/l, Directive 84/449/EEC, C.2

##### **Acute toxicity to algae/aquatic plants**

ErC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, > 500 mg/l, OECD Test Guideline 201 or Equivalent

##### **Toxicity to bacteria**

EC0, activated sludge, static test, 0.5 Hour, Respiration rates., > 2,000 mg/l, activated sludge test (OECD 209)

#### Polyethylene glycol monomethyl ether

##### **Acute toxicity to fish**

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).  
For this family of materials:  
LC50, Pimephales promelas (fathead minnow), 96 Hour, > 10,000 mg/l

##### **Acute toxicity to aquatic invertebrates**

For this family of materials:  
LC50, Daphnia magna (Water flea), 48 Hour, > 10,000 mg/l

#### Triethylene glycol monobutyl ether

##### **Acute toxicity to fish**

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).  
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, 2,200 - 4,600 mg/l, DIN 38412

##### **Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 500 mg/l, OECD Test Guideline 202 or Equivalent

##### **Acute toxicity to algae/aquatic plants**

EC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 62.5 mg/l, OECD Test Guideline 201 or Equivalent

##### **Toxicity to bacteria**

IC50, Bacteria, static test, 16 Hour, > 5,000 mg/l

**Polyalkylene glycol monobutyl ether**

**Acute toxicity to fish**

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).  
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 24,500 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, 21,000 mg/l, OECD Test Guideline 202 or Equivalent

**Toxicity to bacteria**

IC50, Bacteria, static test, 16 Hour, Growth inhibition, 32,000 mg/l, OECD 209 Test

**Diethylene glycol monobutyl ether**

**Acute toxicity to fish**

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).  
LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 Hour, 1,300 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

ErC50, alga Scenedesmus sp., static test, 96 Hour, Growth rate inhibition, > 100 mg/l, OECD Test Guideline 201 or Equivalent  
ErC50, alga Scenedesmus sp., static test, 96 Hour, Biomass, > 100 mg/l, OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**

EC50, Bacteria, static test, 255 mg/l

**Polyethylene glycol monobutyl ether**

**Acute toxicity to fish**

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).  
Based on information for a similar material:  
LC50, Fish, semi-static test, 96 Hour, > 1,800 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

Based on information for a similar material:  
EC50, Daphnia magna (Water flea), static test, 48 Hour, > 3,200 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

Based on information for a similar material:  
ErC50, Scenedesmus capricornutum (fresh water algae), static test, 72 Hour, Growth rate inhibition, 2,490 mg/l, OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**

IC50, activated sludge, static test, 16 Hour, Growth inhibition, > 5,000 mg/l

**Tetraethylene glycol monomethyl ether**

**Acute toxicity to fish**

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).  
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 10,000 mg/l

**Acute toxicity to aquatic invertebrates**

LC50, Daphnia magna (Water flea), static test, 48 Hour, > 10,000 mg/l

**Acute toxicity to algae/aquatic plants**

EC50, alga Scenedesmus sp., 72 Hour, Biomass, > 500 mg/l

**Toxicity to bacteria**

IC50, Bacteria, 16 Hour, > 5,000 mg/l  
EC50, activated sludge, 3 Hour, > 12,500 mg/l, OECD 209 Test

**Diethylene glycol monomethyl ether**

**Acute toxicity to fish**

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).  
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 5,741 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, 1,192 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

EC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Biomass, > 1,000 mg/l, OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**

EC50, activated sludge, 0.5 Hour, > 1,000 mg/l

**2-Piperazinoethanol**

**Acute toxicity to fish**

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).  
LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 6,410 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

LC50, Daphnia magna (Water flea), 48 Hour, 384 mg/l, OECD Test Guideline 202 or Equivalent

**Toxicity to bacteria**

EC50, Bacteria, 16 Hour, > 5,000 mg/l, hUCC

**Persistence and degradability**

**Triethylene glycol monomethyl ether**

**Biodegradability:** Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Pass

**Biodegradation:** 100 %

**Exposure time:** 13 d

**Method:** OECD Test Guideline 301B or Equivalent

**Theoretical Oxygen Demand:** 1.75 mg/mg

#### Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	29 %
10 d	33 %
20 d	71 %

#### Photodegradation

**Atmospheric half-life:** 3.2 Hour

**Method:** Estimated.

#### Polyethylene glycol monomethyl ether

**Biodegradability:** For this family of materials: Biodegradation under aerobic static laboratory conditions is low (BOD20 or BOD28/ThOD between 2.5 and 10%).

#### Triethylene glycol monobutyl ether

**Biodegradability:** 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).

10-day Window: Fail

**Biodegradation:** 85 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301D or Equivalent

**Theoretical Oxygen Demand:** 2.10 mg/mg

#### Polyalkylene glycol monobutyl ether

**Biodegradability:** 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.

10-day Window: Fail

**Biodegradation:** 45 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B or Equivalent

10-day Window: Fail

**Biodegradation:** 44 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301F or Equivalent

#### Diethylene glycol monobutyl ether

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

10-day Window: Not applicable

**Biodegradation:** 89 - 93 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301C or Equivalent

10-day Window: Not applicable

**Biodegradation:** 100 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 302B or Equivalent

**Theoretical Oxygen Demand:** 2.17 mg/mg

#### Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	27 %
10 d	60 %
20 d	81 %

#### Photodegradation

**Test Type:** Half-life (indirect photolysis)

**Sensitization:** OH radicals

**Atmospheric half-life:** 11 Hour

**Method:** Estimated.

#### Polyethylene glycol monobutyl ether

**Biodegradability:** Based on information for a similar material: Material is expected to be readily biodegradable.

10-day Window: Pass

**Biodegradation:** 76 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301D or Equivalent

#### Photodegradation

**Sensitization:** OH radicals

**Atmospheric half-life:** 0.21 d

**Method:** Estimated.

#### Tetraethylene glycol monomethyl ether

**Biodegradability:** Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

10-day Window: Fail

**Biodegradation:** 63.9 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B or Equivalent

10-day Window: Not applicable

**Biodegradation:** 99 %

**Exposure time:** 8 d

**Method:** OECD Test Guideline 302B or Equivalent

#### Diethylene glycol monomethyl ether

**Biodegradability:** 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).

10-day Window: Pass

**Biodegradation:** 100 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B or Equivalent

**Theoretical Oxygen Demand:** 1.73 mg/mg

**Photodegradation**

**Atmospheric half-life:** 4.9 Hour

**Method:** Estimated.

### 2-Piperazinoethanol

**Biodegradability:** Biodegradation under aerobic static laboratory conditions is moderate (BOD<sub>20</sub> or BOD<sub>28</sub>/ThOD between 10 and 40%).

**Theoretical Oxygen Demand:** 2.83 mg/mg Calculated.

**Chemical Oxygen Demand:** 1.81 mg/mg Dichromate

**Biological oxygen demand (BOD)**

Incubation Time	BOD
5 d	3 - 5 %
10 d	3 - 6 %
20 d	6 - 13 %

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitization:** OH radicals

**Atmospheric half-life:** 0.057 d

**Method:** Estimated.

**Bioaccumulative potential**

### Triethylene glycol monomethyl ether

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

**Partition coefficient: n-octanol/water(log Pow):** -1.12 at 20 °C Measured

### Polyethylene glycol monomethyl ether

**Bioaccumulation:** For this family of materials: No bioconcentration is expected because of the relatively high water solubility.

### Triethylene glycol monobutyl ether

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

**Partition coefficient: n-octanol/water(log Pow):** 0.51 at 20 °C Measured

### Polyalkylene glycol monobutyl ether

**Bioaccumulation:** For this family of materials: No bioconcentration is expected because of the relatively high water solubility.

**Diethylene glycol monobutyl ether**

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

**Partition coefficient: n-octanol/water(log Pow):** 1 Measured

**Polyethylene glycol monobutyl ether**

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

**Partition coefficient: n-octanol/water(log Pow):** 0.436 at 20 °C Measured

**Tetraethylene glycol monomethyl ether**

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

**Partition coefficient: n-octanol/water(log Pow):** -1.73 Estimated.

**Diethylene glycol monomethyl ether**

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

**Partition coefficient: n-octanol/water(log Pow):** -0.47 at 20 °C Measured

**2-Piperazinoethanol**

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

**Partition coefficient: n-octanol/water(log Pow):** -1.56 Estimated.

**Mobility in soil**

**Triethylene glycol monomethyl ether**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 10 Estimated.

**Polyethylene glycol monomethyl ether**

No data available.

**Triethylene glycol monobutyl ether**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 10 Estimated.

**Polyalkylene glycol monobutyl ether**

No relevant data found.

**Diethylene glycol monobutyl ether**

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 (Koc):** 2 Estimated.

**Polyethylene glycol monobutyl ether**

No data available.

**Tetraethylene glycol monomethyl ether**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 10 Estimated.

**Diethylene glycol monomethyl ether**

Potential for mobility in soil is very high (Koc between 0 and 50).



Partition coefficient (Koc): < 1 Estimated.

### **2-Piperazinoethanol**

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 7 Estimated.

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## **13. DISPOSAL CONSIDERATIONS**

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**Disposal methods:** 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: Incinerator or other thermal destruction device.

**Treatment and disposal methods of used packaging:** Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

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## **14. TRANSPORT INFORMATION**

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### **DOT**

Not regulated for transport

### **Classification for SEA transport (IMO-IMDG):**

Not regulated for transport

**Transport in bulk  
according to Annex I or II  
of MARPOL 73/78 and the  
IBC or IGC Code**

Consult IMO regulations before transporting ocean bulk

### **Classification for AIR transport (IATA/ICAO):**

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. 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.

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## 15. REGULATORY INFORMATION

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

The following components are subject to reporting levels established by SARA Title III, Section 313:

Components	CASRN
Triethylene glycol monomethyl ether	112-35-6
Triethylene glycol monobutyl ether	143-22-6
Diethylene glycol monobutyl ether	112-34-5
Diethylene glycol monomethyl ether	111-77-3
Ethylene glycol monobutyl ether	111-76-2

### Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103

This material does not contain any components with a CERCLA RQ.

### Pennsylvania Right To Know

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Triethylene glycol monomethyl ether	112-35-6
Triethylene glycol monobutyl ether	143-22-6
Diethylene glycol monobutyl ether	112-34-5

### California Prop. 65

WARNING: This product can expose you to chemicals including Propylene oxide, Ethylene Oxide, which is/are known to the State of California to cause cancer, and 2-Methoxyethanol, Ethylene glycol, Ethylene Oxide, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

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## 16. OTHER INFORMATION

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### Hazard Rating System

#### NFPA

Health	Flammability	Instability
3	1	0

### Revision

Identification Number: 369368 / A749 / Issue Date: 10/15/2018 / Version: 7.0

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

### Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
Dow IHG	Dow Industrial Hygiene Guideline

SKIN	Absorbed via skin
TWA	Time weighted average

### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

### Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

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