

AMSOIL Material Safety Data Sheet

Date Issued/Revised: January 4, 2008

Supersedes:

Section 1: Product and Company Identification

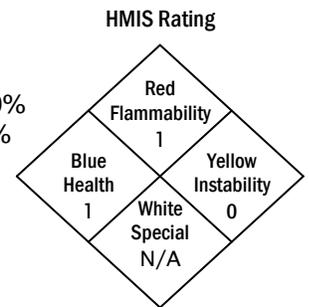
Manufacturer: **AMSOIL INC.** Telephone: **CHEMTREC (Spill Emergency Only): 1-800-424-9300**
 925 Tower Avenue Information: 715-392-7101
 Superior, WI 54880

AMSOIL Product Code.....BF-3
 Product Label NameSeries 500 High Performance DOT 3 Brake Fluid
 Product Use.....BRAKE FLUID

Section 2: Composition/Information on Ingredients

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)

| Component | CAS# | Weight% |
|--------------------------------------|------------|----------------|
| Triethylene glycol monobutyl ether | 143-22-6 | >40.0 - <60.0% |
| Polyethylene glycol monobutyl ether | 9004-77-7 | >1.0 - <20.0% |
| Poly (ethylene oxide) | 25322-68-3 | <15.0% |
| Triethylene glycol monomethyl ether | 112-35-6 | <15.0% |
| Tetraethylene glycol | 112-60-7 | <15.0% |
| Triethylene glycol | 112-27-6 | <10.0% |
| Diethylene glycol monobutyl ether | 112-34-5 | <10.0% |
| Polyethylene glycol monomethyl ether | 9004-74-4 | <10.0% |
| Pentaethylene glycol | 4792-15-8 | <10.0% |
| Diethylene glycol | 111-46-6 | <5.0% |
| Diisopropanolamine | 110-97-4 | <1.0% |
| Sodium hydroxide | 1310-73-2 | <1.0% |



*See Section 8 for exposure limits.

Section 3: Hazards Identification

POTENTIAL HEALTH EFFECTS: **DANGER!** Causes severe eye burns. Evacuate area.

OSHA Hazard Communication Standard

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

Potential Health Effects

- Eye Contact: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
- Skin Contact: Brief contact is essentially non-irritating to skin.
- Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
- Inhalation: Prolonged exposure is not expected to cause adverse effects. At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause adverse effects.
- 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. Oral toxicity is expected to be greater in humans due to triethylene glycol even though tests in animals show a lower degree of toxicity. Oral toxicity is expected to be moderate in humans due to diethylene glycol even though test with animals show a lower degree of toxicity.
- Effects of Repeated Exposure: Vapor from heated material or mist may cause respiratory irritation. In animals, effects have been reported on the following organs: Bladder, Blood, Gastrointestinal tract, Kidney, Liver, Nervous system, Respiratory tract.
- Birth Defects/Developmental Effects: Triethylene glycol did not cause birth defects in animals; other effects were seen in the fetus only at very high doses which caused toxic effects to the mother. 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.

Supersedes:

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

Section 4: First Aid Measures

- EYE:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.
- SKIN:** Wash skin with plenty of soap and water.
- INHALATION:** Remove exposed person to fresh air. If breathing is labored give oxygen. If breathing has stopped apply artificial respiration. Get immediate medical attention.
- INGESTION:** DO NOT INDUCE VOMITING. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (1/3 – 1/2 Cup) of (90-120 ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounces (1 1/2 tsp.) (8ml) liquor for each 10 pounds of body weight, or 2ml per kg body weight [e.g., 1.2 ounces (2 1/3 tbsp.) for a 40 pound child or 36 ml for an 18 kg child]

NOTE TO PHYSICIAN: 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, following by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15mg/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 respiratory distress. Maintain adequate ventilation and oxygenation of the patient. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Section 5: Fire Fighting Measures

FLAMMABILITY PROPERTIES:

| | |
|----------------------------------|----------------|
| Flash Point | 290°F (143°C) |
| Method | ASTM D 93 |
| LFL/UFL | Not Determined |
| Auto-ignition Temperature | Not Determined |

EXTINGUISHING MEDIA: Water fog or fine spray. Carbon dioxide, dry chemical, and 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.

FIREFIGHTING EQUIPMENT: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire 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. Burning liquid may be moved by flushing 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 (including fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

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.

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 and carbon dioxide. Combustion products may include trace amounts of nitrogen oxides.

Section 6: Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Absorb with materials such as sand or vermiculite. Collect suitable and properly labeled containers. Large spills: Dike area to contain spill. Pump in suitable and properly labeled containers.

Personal Precautions: Use appropriate safety equipment. For additional information, refer to Section 7 & 8, Exposure Controls and Personal Protection.

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

Section 7: Handling and Storage

HANDLING: Keep containers closed. Do not puncture or incinerate can. Avoid contact with eyes, skin or clothing. Wash hands thoroughly after handling. Empty container may retain product residue which may exhibit hazards of product. Avoid breathing mist.

STORAGE: Store in the following materials: Carbon steel, stainless steel, phenolic lined steel drums. Do not store in aluminum, copper, galvanized iron or galvanized steel.

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

Section 8: Exposure Controls/Personal Protection

| Component | List | Type | Value |
|-----------------------------------|------|-----------------|-----------|
| Diethylene glycol | WEEL | TWA | 10 mg/m3 |
| Poly (ethylene oxide) | WEEL | TWA Particulate | 10 mg/m3 |
| Triethylene glycol | | TWA Total | 100 mg/m3 |
| Diethylene glycol monobutyl ether | | TWA | 35 ppm |
| Diisopropanolamine | | TWA | 10 ppm |
| Pentaethylene glycol | WEEL | TWA Particulate | 10 mg/m3 |

VENTILATION: Use adequate general or local exhaust ventilation to keep airborne concentrations below exposure limits.

RESPIRATORY: Use a NIOSH approved respirator when necessary. Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

SKIN: Use Viton or Nitrile gloves to avoid prolonged or repeated skin contact.

EYE: Use splash goggles or face shield where splashing is expected or can occur. Eye wash should be located in immediate work area.

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

Section 9: Physical and Chemical Properties

| | |
|---|----------------------|
| Physical State | Liquid |
| Boiling Point | 543°F (284°C) |
| Freezing Point | -53°F (-47°C) |
| Vapor Pressure | <0.01 mmHg @ 20°C |
| Vapor Density (Air=1)..... | 7 Estimated |
| Evaporation Rate | Not Determined |
| Solubility in Water | 100% Estimated |
| Specific Gravity (Water=1) | 1.010 – 1.040 |
| Density, lb./gal..... | Not Determined |
| Volatility (Volume) | Unknown |
| VOC..... | Unknown |
| pH..... | 7.0 - 11.5 FMVSS 116 |
| Coefficient of Water/Oil Distribution | Not Determined |
| Odor | Mild |
| Odor Threshold | Not Determined |
| Appearance | Colorless to brown |
| Viscosity, cSt @ 100°C | 2.0 |
| Viscosity, cSt @ 40°C | Not Applicable |
| Viscosity Index | Not Applicable |

Section 10: Stability and Reactivity

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

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.

INCOMPATIBILITY: Avoid contact with strong oxidizers or strong acids.

HAZARDOUS POLYMERIZATION: Will not occur.

THERMAL DECOMPOSITION: Decomposition products depend upon temperature, air supply and the presence of other materials.
Decomposition products can include but are not limited to aldehydes, ketones, and organic acids.

Section 11: Toxicological Information

ACUTE EXPOSURE

- Ingestion: For some components: LD50, Rat > 5,660 mg/kg. Diethylene glycol: Lethal dose, Human, adult 2 ounces.
- Skin Absorption: Based on information for component(s): LD50, Rabbit >3,480 mg/kg.
- Repeated Dose Toxicity: Vapor from heated material or mist may cause respiratory irritation. In animals, effects have been reported on the following organs: bladder, blood, gastrointestinal track, kidney, liver, nervous system, and respiratory tract.

CHRONIC EXPOSURE

Chronic Toxicity: Did not cause cancer in laboratory animals. Diethylene glycol has been tested for carcinogenicity in animal studies and is not believed to pose a carcinogenic risk to man.

Developmental: Triethylene glycol did not cause birth defects in animals; other effects were seen in the fetus only at very high doses which caused toxic effects to the mother. 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. In animal studies, did not interfere with reproduction.

Genetic Toxicity: In vitro genetic toxicity studies were negative. Animals genetic toxicity studies were negative.

Inhalation:

Section 12: Ecological Information

Data For Component: Triethylene glycol monobutyl ether

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).
Henry's Law Constant (H): 6.79E-10 atm*m³/mole; 25°C Estimated
Partition Coefficient, n-octanol/water (log Pow): 0.02 Estimated
Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated
Persistence & Degradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches >70% mineralization in OECD test for inherent biodegradability).

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|---------------|-----------------------|-----------|
| | 2.5 h | Estimated |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 88 – 92% | 28 d | OECD 301E Test |
| 100% | 28 d | OECD 302B Test |

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|-------|--------|--------|--------|
| | 5.2% | 23.8% | |

Theoretical Oxygen Demand: 2.10 mg/mg

Data For Component: Poly (ethylene oxide)

Movement & Partitioning: For this family of materials: 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. No bioconcentration is expected because of the relatively high water solubility.
Persistence & Degradability: For this family of materials: Material is expected to be readily biodegradable.

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|---------|---------|----------|--------|
| 0 – 17% | 3 - 38% | 39 - 70% | |

Theoretical Oxygen Demand: 1.64 – 1.74 mg/mg

Data For Component: Triethylene glycol monomethyl ether

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).
Henry's Law Constant (H): 2.66E-9 atm*m³/mole; 25°C Estimated
Partition Coefficient, n-octanol/water (log Pow): -1.46 Estimated
Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated
Persistence & Degradability: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD>

Supersedes:

40%). Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 4.00E-11 cm ³ /s | 3.2 h | Estimated |
| | | |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 99% | 28 d | OECD 302B Test |

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|-------|--------|--------|--------|
| 29% | 33% | 71% | |

Theoretical Oxygen Demand: 1.75 mg/mg

Data For Component: Tetraethylene glycol

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Henry's Law Constant (H): 3.5E-11 atm*m³/mole; 25°C Estimated

Partition Coefficient, n-octanol/water (log Pow): -2.02 Estimated

Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated

Bioconcentration Factor (BCF): 3.2; Estimated

Persistence & Degradability: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD> 40%). 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 biodegradeable under environmental conditions

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 5.04E-11 cm ³ /s | 2.55 h | Estimated |
| | | |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 40% | 28 d | OECD 301D Test |

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|-------|--------|--------|--------|
| <2.5% | 3% | 43% | |

Theoretical Oxygen Demand: 1.65 mg/mg

Data For Component: Triethylene glycol

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Henry's Law Constant (H): 4.37E-10 atm*m³/mole; 25°C Estimated

Partition Coefficient, n-octanol/water (log Pow): -1.75 Estimated

Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated

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

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 3.64E-11 cm ³ /s | 3.5 h | Estimated |
| | | |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 25 - 92% | | OECD 301C Test |

Supersedes:

| | | |
|-----------|---------|----------------|
| >70 – 95% | 2 – 14d | OECD 302B Test |
|-----------|---------|----------------|

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|----------|----------|----------|--------|
| 12 - 32% | 15 - 64% | 17 - 86% | |

Theoretical Oxygen Demand: 1.60 mg/mg

Data For Component: Diethylene glycol monobutyl ether

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).

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

Henry's Law Constant (H): 1.52E-9 atm*m³/mole; 25°C Estimated

Partition Coefficient, n-octanol/water (log Pow): 0.56 Estimated

Partition Coefficient, soil organic carbon/water (Koc): 2 Estimated

Persistence & Degradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 3.62E-11 cm ³ /s | 11 h | Estimated |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 89 - 93% | 28 d | OECD 301C Test |
| 100% | 28 d | OECD 302B Test |

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|-------|--------|--------|--------|
| <2.5% | | 50% | |

Theoretical Oxygen Demand: 2.17 mg/mg

Data For Component: Polyethylene glycol monomethyl ether

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).

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

Henry's Law Constant (H): 2.66E-9 atm*m³/mole; 25°C Estimated

Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated

Persistence & Degradability: Biodegradation under aerobic static laboratory conditions is moderate (BOD20 or BOD28/ThOD between 10 and 40%). Biodegradation rate may increase in soil and/or water with acclimation.

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|----------------------------|-----------------------|-----------|
| 4.00E-11cm ³ /s | 3.2 h | Estimated |

Theoretical Oxygen Demand: 1.75 mg/mg

Data For Component: Diethylene glycol

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 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): 7.96E-10 atm*m³/mole; 25°C Estimated

Partition Coefficient, n-octanol/water (log Pow): -1.47 Estimated

Partition Coefficient, soil organic carbon/water (Koc): <1 Estimated

Persistence & 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

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 2.23E-11 cm ³ /s | 5.7 h | Estimated |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 92% | 28 d | OECD 301C Test |

Supersedes:

| | | |
|-----------|------|----------------|
| 82 – 98 % | 28 d | OECD 302B Test |
|-----------|------|----------------|

Theoretical Oxygen Demand: 1.51 mg/mg

Data For Component: Pentaethylene glycol

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 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 important fate process.

Henry's Law Constant (H): <2.54E-11 atm*m³/mole; 25°C Estimated

Partition Coefficient, n-octanol/water (log Pow): -2.30 Estimated

Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-----------------------------|-----------------------|-----------|
| 6.44E-11 cm ³ /s | 2 h | Estimated |

Theoretical Oxygen Demand: 1.68 mg/mg

Data For Component: Diisopropanolamine

Movement & Partitioning: Bioconcentration potential is low (BCF less than 100 or log Pow less than 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): 2.52E-11 atm*m³/mole; 25°C Estimated from vapor pressure and water solubility.

Partition Coefficient, n-octanol/water (log Pow): -0.82 Measured

Partition Coefficient, soil organic carbon/water (Koc): 1 Estimated

Persistence & Degradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation rate may increase in soil and/or water with acclimation. Material ultimately biodegradable (reaches >70% mineralization in OECD test (s) for inherent biodegradability).

Distribution in Environment: Mackay Level 1 Fugacity Model

| Air | Water | Biota | Soil | Sediment |
|-----|-------|-------|------|----------|
| >1% | >99% | 0% | 0% | 0% |

Indirect Photodegradation with OH Radicals

| Rate Constant | Atmospheric Half-life | Method |
|-------------------------------|-----------------------|-----------|
| 101.69E-12 cm ³ /s | 2.52 h | Estimated |

OECD Biodegradation Tests

| Biodegradation | Exposure Time | Method |
|----------------|---------------|----------------|
| 94% | 28 d | OECD 301F Test |
| 90 - 100 % | 7 d | OECD 302B Test |

Biological Oxygen Demand (BOD)

| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
|-------|--------|--------|--------|
| 3% | 60% | 91% | |

Chemical Oxygen Demand: 1.86 mg/mg

Theoretical Oxygen Demand: 2.41 mg/mg

Data For Component: Sodium hydroxide

Movement & Partitioning: No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).

Partition Coefficient, n-octanol/water (log Pow): -3.88 Estimated

Partition Coefficient, soil organic carbon/water (Koc): 14 Estimated

Persistence & Degradability: Biodegradation is not applicable.

ECOTOXICITY

Data For Component: Triethylene glycol monobutyl ether

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

Fish Acute & Prolonged Toxicity

LC50, emerald shiner (Notropis atherinoides), 72 h: > 500mg/l

Aquatic Invertebrate Acute Toxicity

Supersedes:

EC50, water flea (Daphnia magna), static, 48 h, immobilization: >500 – 6,600 mg/l

Aquatic Plant Toxicity

EC50, alga (Scenedesmus s.), biomass growth inhibition, 72 h: >500 mg/l

Toxicity to Micro-organisms

IC50, bacteria, 16 h: 8,000 mg/l

Data for Component: Poly (ethylene oxide)

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

Fish Acute & Prolonged Toxicity

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

Aquatic Invertebrate Acute Toxicity

For this family of materials: LC50, water flea Daphnia magna, static, 48 h: >10,000 mg/l

Data for Component: Triethylene glycol monomethyl ether

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

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (Pimephales promelas): > 10,000 mg/l

Aquatic Invertebrate Acute Toxicity

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

Aquatic Plant Toxicity

EC50, alga (Scenedesmus sp.), biomass growth inhibition, 72 h: > 500 mg/l

Toxicity to Micro-organisms

EC50, bacteria, growth inhibition (cell density reduction), 16 h: > 5,000 mg/l

Data for Component: Tetraethylene glycol

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

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (Oncorhynchus mykiss): >1,000 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea (Daphnia magna): 7,746 mg/l

Aquatic Plant Toxicity

EC50, green alga (Selenastrum capricornutum), biomass growth inhibition: >1,000 mg/l

Toxicity to Micro-organisms

EC50, bacteria, growth inhibition (cell density reduction): 7,500 mg/l

Data For Component: Triethylene glycol

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

Fish Acute & Prolonged Toxicity

LC50, bluegill (Lepomis macrochirus), 96 h: 61,000 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea (Daphnia magna), 48 h: 49,000 mg/l

Toxicity to Micro-Organisms

EC50, bacteria, growth inhibition (cell density reduction), 16 h: >10,000 mg/l

Aquatic Invertebrates Chronic Toxicity Value:

| ChV Value mg/l | Species | Test Type | Endpoint | Exposure Time |
|----------------|----------------------------|----------------|----------|---------------|
| 10607 mg/l | Water flea (Daphnia magna) | Static renewal | Growth | 21 d |

Data For Component: Diethylene glycol monobutyl ether

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

Fish Acute & Prolonged Toxicity

LC50, bluegill (Lepomis macrochirus): 1,300 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea (Daphnia magna), immobilization: 3,200 mg/l

Toxicity to Micro-organisms

EC50, bacteria, growth inhibition: 255 mg/l

Data for Component: Polyethylene glycol monomethyl ether

Material is practically non-toxic to fish on an acute basis (LC50> 100 mg/L).

Fish Acute & Prolonged Toxicity

Supersedes:

LC50, emerald shiner (Notropis atherinoides): > 130 mg/l

Data For Component: Diethylene glycol

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

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (Oncorhynchus mykiss), 96 h: > 1,000 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea (Daphnia magna), 48 h, immobilization: 48,900 mg/l

Aquatic Plant Toxicity

EC50, diatom (Skeletonema costatum), biomass growth inhibition, 72 h: > 1,000 mg/l

Toxicity to Micro-organisms

IC50, OECD 290 Test, activated sludge, respiration inhibition, 3 h: >1,000 mg/l

Data for Component: Diisopropanolamine

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

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (Pimephales promelas), static, 96 h: > 580 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea (Daphnia magna), 48 h, immobilization: 277.7 mg/l

Aquatic Plant Toxicity

EC50, alga (Scenedesmus sp.), 72 h: 270 mg/l

Toxicity to Micro-organisms

EC50, activated sludge, respiration inhibition, 30 min: > 1,995 mg/l

Data for Component: Sodium hydroxide

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). May increase pH of aquatic systems to > pH 10 which may be toxic to aquatic organisms.

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (Oncorhynchus mykiss), 96 h: 45.5 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea (Daphnia magna): 40 - 240 mg/l

Section 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. 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: Do not reuse containers for any purpose. Empty containers should be recycled or otherwise disposed of by approved waste management facility. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations.

Section 14: Transport Information

| | | | |
|---------------------|-----------------|---------------|------------------|
| DOT Non-Bulk | DOT Bulk | IMDG | ICAO/IATA |
| NOT REGULATED | NOT REGULATED | NOT REGULATED | NOT REGULATED |

Section 15: Regulatory Information

U.S. Federal Regulations

| | |
|--------------------------------------|-----------------------|
| OSHA Table Z | Hazardous Chemical |
| TSCA | All components listed |
| SARA Title III | |
| Section 302 Extremely Hazardous..... | Not Applicable |
| Section 311/312 | |
| Fire Hazard | No |
| Reactive Hazard..... | No |
| Release of Pressure..... | No |

Supersedes:

Acute Health Hazard Yes
 Chronic Health Hazard Yes

Section 313 Toxic Chemical

| Component | CAS# | Weight% |
|-------------------------------------|----------|----------------|
| Triethylene glycol monobutyl ether | 143-22-6 | >40.0 - <60.0% |
| Triethylene glycol monomethyl ether | 112-35-6 | <15.0% |
| Diethylene glycol monobutyl ether | 112-34-5 | <10.0 |

U.S. State Regulations

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substance List and/or Pennsylvania Environmental Substance List, and are present at levels which require reporting.

| Component | CAS# | Weight% |
|-------------------------------------|-----------|----------------|
| Triethylene glycol monobutyl ether | 143-22-6 | >40.0 - <60.0% |
| Triethylene glycol | 112-27-6 | <10.0% |
| Triethylene glycol monomethyl ether | 112-35-6 | <15.0% |
| Diethylene glycol | 111-46-6 | <5.0% |
| Diethylene glycol monobutyl ether | 112-34-5 | <10.0% |
| Diisopropanolamine | 110-97-4 | <10.0% |
| Sodium hydroxide | 1310-73-2 | <1.0% |

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substance List: To the best of our knowledge, this products does not contain chemicals at levels which require reporting under this stature

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

| Component | CAS# | Weight% |
|-------------------------------------|-----------|----------------|
| Triethylene glycol monobutyl ether | 143-22-6 | >40.0 - <60.0% |
| Triethylene glycol monomethyl ether | 112-35-6 | <15.0% |
| Diethylene glycol monobutyl ether | 112-34-5 | <10.0% |
| Sodium hydroxide | 1310-73-2 | <1.0% |

US. New Jersey Community Right-to-Know Survey, Table A: NJ Environmental Hazardous SAsubstances [EHS] List (N.J. Admin. Code Titel 7 Section 1G-2.1)

| Component | CAS# | Weight% |
|-------------------------------------|----------|----------------|
| Triethylene glycol monobutyl ether | 143-22-6 | >40.0 - <60.0% |
| Triethylene glycol monomethyl ether | 112-35-6 | <15.0% |
| Diethylene glycol monobutyl ether | 112-34-5 | <10.0% |

California (Prop 65)

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

International Regulations

U.S. Toxic Substance Control Act: All components of this product are either on the TSCA Inventory, are exempt TSCA Inventory Requirements under 40 CFR 720.30, or comply with the PMN Polymer Exemption 40 CFR 723.250

European Inventory of Existing Commercial Chemical Substances (EINECS): The components of this product are on the EINECS inventory or are exempt from inventory requirements.

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.

Australia. Industrial Chemical (Notification & Assessment) Act: The principal components and additives of this product are included in the Australian Inventory of Chemical Substances (AICS) or comply with the requirements of the Industrial Chemicals (Notification & Assessment) Act 1989.

China. Inventory of Existing Chemical Substances: This product is listed on, or complies with, the State Environmental Protection Agency (SEPA) China Chemical Inventory.

Supersedes:

Japan. Industrial Safety & Safety & Health Law (ISHL) List: All components of this product are in compliance with ISHL (Japan, Industrial Safety and Health Law) inventory rules.

Japan. Kashin-Hou Law List:

Korea Existing Chemicals Inventory (KECI): The components of this product are on the Korea Existing Chemicals Inventory (KECI) or are exempt from the inventory requirements.

Section 16: Other Information

The information and recommendations contained herein are, to the best of AMSOIL's knowledge and belief, accurate and reliable as of the date issued. AMSOIL makes no warranty or guarantee, expressed or implied, of their accuracy or reliability, and AMSOIL shall not be liable for any loss or damage based upon the criteria supplied by the developers of these rating systems, together with AMSOIL's interpretation of the available data.