

BOSS LUBRICANTS: MATERIAL SAFETY DATA SHEET:

1. PRODUCT AND COMPANY IDENTIFICATION

EFFECTIVE DATE: 2012/01/01
PRODUCT: UNINHIBITED ETHYLENE GLYCOL
PRODUCT USE: COOLANT

MANUFACTURER
BOSS LUBRICANTS
112, 6303 – 30 STREET S.E.
CALGARY, AB CANADA
T2C 1R4

TELEPHONE NUMBERS
BOSS EMERGENCY NUMBER 1-800-844-9457
CANUTTEC 24 HOUR EMERGENCY 613-996-666

This MSDS was prepared by the Toxicology and Material Safety Section of BOSS LUBRICANTS.

2. INGREDIENTS

| MATERIAL | CAS# | % BY WT. | PEL (OSHA) | TLV (AGGIH) |
|-------------------|-------------|-----------------|-------------------|--------------------|
| Ethylene Glycol | 107-21-1 | 90 - 95 | 50 ppm | 50ppm |
| Diethylene Glycol | 111-46-6 | 0 - 5 | None | None |

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Slight Odor. **May be fatal if swallowed** **Vapors can cause eye irritation**

LOWEST KNOWN LD50 (ORAL) 107-21-1 5840 mg/kg (Rats)
LOWEST KNOWN LD 50 (SKIN) 107-21-1 9530 mg/kg (Rabbits)

HAZARD RATING SYSTEM (NFPA)

HEALTH: 1 **FLAMMABILITY: 1** **REACTIVITY: 0**

KEY: 0 – Minimal, 1 – Slight, 2 – Moderate, 3 – Serious, 4 – Severe

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POTENTIAL HEALTH EFFECTS

Routes of Exposure: Inhalation, Ingestion, Skin Contact/Absorption, Eye Contact

EYE: May cause slight transient (temporary) eye irritation. Corneal injury is unlikely. Vapors or mists may cause eye irritation .

SKIN: Prolonged or repeated exposure not likely to cause significant skin irritation. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated skin exposure may result in absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potential lethal amounts.

INGESTION: Single dose oral toxicity is considered to be moderate. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing amounts larger than that may cause serious injury, even death.

INHALATION: At room temperature, exposures to vapors are minimal due to physical properties; higher temperatures may generate vapor levels sufficient to cause adverse effects.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Repeated excessive exposures may cause severe kidney and also liver and gastrointestinal effects. Signs and symptoms of excessive exposure may be nausea and/or vomiting. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects. Observations in animals include formation of bladder stones after repeated oral doses of ethylene glycol. Reports of kidney failure and death in burn patients suggest the ethylene glycol may have been a factor. The use of topical applications containing this material may not be appropriate in severely burned patients or individuals with impaired renal function.

CANCER INFORMATION: Based on data from long-term animal studies, ethylene glycol is not believed to pose a carcinogenic risk to man.

TERATOLOGY (BIRTH DEFECTS): Exposure to ethylene glycol has caused birth defects in laboratory animals only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Ethylene glycol has not interfered with reproduction in animal studies except at very high doses

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4. FIRST AID MEASURES

Ensure physician has access to this Material Safety Data Sheet.

Eyes: Immediately flush eyes with large amounts of water for 15 minutes, lifting lower and upper lids. Get medical attention as soon as possible. Contact lenses should never be worn when working with this chemical.

Skin: Flush area of skin immediately with large amounts of water for at least 15 minutes while removing contaminated clothing. If irritation persists after flushing, get medical attention promptly. Wash clothing before re-use.

Inhalation: If inhaled, immediately remove victim to fresh air and call **emergency medical care**. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: If swallowed, give two glasses of water and immediately call physician. Induce vomiting of conscious patient by pressing finger down throat. Small amounts entering mouth should be rinsed out for 5 minutes.

5. FIRE FIGHTING MEASURES

FLAMMABILITY PROPERTIES

FLASH POINT: 119°C (247°F)

METHOD USED: Setaflash

AUTOIGNITION TEMPERATURE: Autoignition temperature for ethylene glycol is 398°C (748°F)

FLAMMABILITY LIMITS - % of vapor concentration at which product can ignite in presence of spark.

Lower Flammability Limit: 3.2%

Upper Flammability limit: 22%

HAZARDOUS COMBUSTION PRODUCTS: Hazardous combustion products may include and are not limited to carbon monoxide, carbon dioxide and trace amounts of aldehydes and organic acids. When available oxygen is limited, as in a fire or when heated to very high temperatures be a hot wire or plate, carbon monoxide and other hazardous compounds such as aldehydes might be generated.

EXTINGUISHING MEDIA: Water fog or fine spray. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Carbon dioxide. Dry chemical. Do not use direct water stream, as it may spread the fire.

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Exposure Controls cont'd

Escape: Any air-purifying full face piece respirator (gas mask) with a chin-style or front-or back-mounted organic vapor canister or any appropriate escape-type self-obtained breathing apparatus.

Skin Protection: Protective gloves recommended when prolonged skin contact cannot be avoided. Polyethylene; Neoprene; Nitrile, Polyvinyl Alcohol; Natural Rubber, Butyl Rubber. Safety shower should be available.

Eye Protection: Safety goggles and face shield. Emergency eyewash should be available. Contact Lenses should not be worn when working with this chemical.

Engineering Controls: Use general or local exhaust ventilation to meet TLV requirements.

9. PHYSICAL PROPERTIES

| | |
|-----------------------------------|-----------------------|
| BOILING RANGE: | 171-175°C (339-348°F) |
| MAX. FREEZE POINT: | -18°C (0°F) |
| SPECIFIC GRAVITY (WATER=1): | 1.12 |
| POUNDS/GALLON: | 9.3 |
| VAPOR PRESSURE (mm of Hg) @ 20°C: | <0.1 |
| VAPOR DENSITY (air=1): | 2.1 |
| WATER SOLUBILITY: | Complete |
| EVAPORATION RATE (BuAC=1) | Nil |
| % VOLATILE BY VOLUME: | 97.0 |
| APPEARANCE: | Fuchsia colored |
| ODOR: | Mild |

10. STABILITY AND REACTIVITY

| | |
|-----------------------------------|---|
| STABILITY: | Stable |
| CONDITIONS TO AVOID: | Isolate from oxidizers, heat & open flame. |
| MATERIALS TO AVOID: | Isolate from strong oxidizers such as permanganates, chromates & peroxides. |
| HAZARDOUS DECOMPOSITION PRODUCTS: | Carbon monoxide, carbon dioxide from burning. |
| HAZARDOUS POLYMERIZATION: | Material is not known to polymerize. |

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11. TOXICOLOGICAL INFORMATION

SKIN: The dermal LD50 has not been determined.

INGESTION: The lethal dose in humans is estimated to be 100 ml (3 ounces). The oral LD 50 for rats is in the 6,000-1300 mg/kg range.

MUTAGENICITY (THE EFFECTS IN GENETIC MATERIAL). In vitro mutagenicity Studies were negative. Animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE

MOVEMENT & PARTIONING: Bioconcentration potential is low (BCF less than 100 or Log Kow less than 3). Log octanol/water partition coefficient (Log Kow) is -1.36. Henry's Law Constant (H) is 6.0E-08 atm-m³/mol. Bioconcentration factor (BCF) is 10 on golden orfe.

DEGRADATION & TRANSFORMATION: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD greater than 40%). 5-Day biochemical oxygen demand (BOD5) is 0.78p/p. 10-Day biochemical oxygen demand is (BOD10) is 1.06p/p. 20-Day biochemical oxygen demand (BOD20) is 1.15 p/p. Theoretical oxygen demand (ThOD) is calculated to be 1.29 p/p. Biodegradation may occur under both aerobic and anaerobic conditions (in either the presence or absence of oxygen). Inhibitory concentration (IC50) in OECD "Activated Sludge, Respiration Inhibition Test" (Guideline #209) is <1000 mg/L. Degradation is expected in the atmospheric environment within days to weeks.

ECOTOXICOLOGY: Material is practically non-toxic to aquatic organisms on an acute basis (LC50 greater than 100 mg/L in most sensitive species). Acute LC50 for fathead minnow (*Pimephales promelas*) is 51,000 mg/L. Acute LC50 for bluegill (*Lepomis macrochirus*) is 27,549 mg/L. Acute LC50 for rainbow trout (*Oncorhynchus mykiss*) is about 18,000 – 46,000 mg/L. Acute LC50 for guppy (*Poecilia reticulata*) is about 49,300 mg/L. Acute LC50 for water flea (*Daphnia magna*) is 46,300-51,100 mg/L. Acute LC50 for the cladoceran *Ceriodaphnia dubia* is 10,00 – 25,800 mg/L. Acute LC50 for crayfish is 91,430 mg/L. Acute LC50 for brine shrimp (*Artemia salina*) is 20,00 mg/L. Acute LC50 for golden orfe (*Leuciscus idus*) is greater than 10,000 mg/L. Acute LC50 for goldfish (*Carassius auratus*) is greater than 5,00 mg/L. Growth inhibition EC50 for green alga (*Selenastrum capricornutum*) is 9,500 – 13,00 mg/L.

13. DISPOSAL CONSIDERATIONS

DO NOT discharge to sewer. Wear appropriate personal protection. Take up with sand, vermiculite, or similar inert material. Dispose in accordance with federal, state and local regulations.

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14. TRANSPORTATION INFORMATION

(FOR BULK SHIPMENT ONLY)

| | | | |
|-----------------------|---|-----------------|--------|
| Proper Shipping Name: | Environmentally Hazardous Substance Liquid NOS (Ethylene Glycol) | | |
| Hazard Class: | 9 | ID Number | UN3082 |
| Label: | Miscellaneous RQ Product | Packaging Group | III |

15. REGULATORY INFORMATION

THIS PRODUCT CONTAINS COMPONENT(S) CITED ON THE FOLLOWING REGULATIONS

| CHEMICAL NAME | CAS NUMBER |
|----------------------|-------------------|
| Ethylene Glycol | 107-21-1 |

**UNITED STATE-
TSCA – Inventory:**

Listed

WATER STANDARDS:

No data available

**ATMOSPHERIC
STANDARDS:**

Clean Air Act (1990) – List of Hazardous Air Contaminants: listed

CERCLA:

Reportable Quantity (RQ): 5,000 pounds (537 gallons)

SARA Title III:

Section 311/312 – Categories: Acute hazard; chronic hazard

Section 312 – Inventory Reporting: Ethylene glycol is subject to Tier I and/or Tier II annual inventory reporting.

Section 313 – Emission Reporting: Ethylene glycol is subject to Form R reporting requirements.

Section 302 – Extremely Hazardous Substances: Ethylene glycol is not listed.

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Regulatory information cont'd

STATE RIGHT-TO-KNOW:

| | |
|--|-----------------------------------|
| California - Exposure Limits - Ceilings: | vapor – 50 ppm; 125 mg/m3 ceiling |
| Director's List of Hazardous Substances: | listed |
| Florida – Hazardous Substances List: | listed |
| Massachusetts – Right-To-Know List: | listed |
| Minnesota – Hazardous Substances List: | listed (particulate and vapor) |
| New Jersey – Right-To-Know List (Total): | present greater than 1.0% |
| Pennsylvania – Right-To-Know List: | environmental hazard |

CANADIAN REGULATIONS:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required.

WHMIS INFORMATION:: D2A – material has potential toxic effects.

Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

16. OTHER INFORMATION

BOSS LUBRICANTS makes no warranty, representation or guarantee as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of this product. Since actual use by others is beyond our control, no warranty, expressed or implied is made by **BOSS LUBRICANTS** as to the effects of such use, the results to be obtained or the safety and toxicity of this product, nor does **BOSS LUBRICANTS** assume liability arising out of the use by others of this product referred to herein. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

