Extended Life Antifreeze

MATERIAL SAFETY DATA SHEET

FOR EMERGENCY ASSISTANCE CALL: 1-800-424-9300 CHEMTREC
FOR ADDITIONAL INFORMATION CALL: 412-321-9800

SECTION 1: PRODUCT IDENTIFICATION

PRODUCT NAME: Extended Life Antifreeze

CHEMICAL DESCRIPTION: Inhibited Ethylene Glycol
PRODUCT CLASS: Closed System
MSDS REVISION: 3-21-2012

SECTION 2: INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>Weight %</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>&gt;49</td>
<td>Ceiling: 50 mg/m³</td>
<td>Ceiling: 50 mg/m³ (vapor)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ceiling: 100 mg/m³ (aerosol)</td>
</tr>
<tr>
<td>Water</td>
<td>None</td>
<td>&lt; 49</td>
<td>None established</td>
<td>None established</td>
</tr>
<tr>
<td>Corrosion Inhibitor</td>
<td>7632-00-0</td>
<td>&lt;3</td>
<td>None established</td>
<td>None established</td>
</tr>
<tr>
<td>Green Dye</td>
<td>None</td>
<td>&lt;1</td>
<td>None established</td>
<td>None established</td>
</tr>
</tbody>
</table>

SECTION 3: HAZARDS IDENTIFICATION

**********************************************************************************EMERGENCY OVERVIEW**********************************************************************************

Red/Orange liquid.
WARNING!
Harmful or fatal if swallowed.
Harmful if inhaled or absorbed through the skin.
May cause an allergic skin reaction.
May cause irritation to the skin, eyes, and respiratory tract.
Affects central nervous system.

**********************************************************************************

PRIMARY ROUTES OF ENTRY: Eye contact, skin contact, ingestion, and inhalation of product mists
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing eye problems, skin disorders, or impaired liver, kidney, or respiratory function may be more susceptible to the effects of this substance.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: May cause slight eye irritation. Corneal injury is unlikely. Vapor or mist may cause eye irritation.

SKIN CONTACT: Brief contact is essentially nonirritating to skin. Prolonged contact may cause slight skin irritation with local redness. Repeated contact may cause skin irritation with local redness.

SKIN ABSORPTION: Prolonged skin contact is unlikely to result in absorption of harmful amounts of ethylene glycol. Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or with material sufficiently hot to burn skin may result in the absorption of potentially lethal amounts of ethylene glycol.

INGESTION: This product contains >49% ethylene glycol. The oral toxicity of ethylene glycol is expected to be moderate in humans, even though tests with animals show a lower degree of toxicity. Initial symptoms in massive dosage parallel alcohol intoxication, progressing to CNS depression, vomiting, headache, rapid respiratory and heart rate, lowered blood pressure, stupor, collapse, and unconsciousness with convulsions. Death from respiratory arrest or cardiovascular collapse may follow. The lethal dose of the product component, ethylene glycol, in humans is 100 mL (3-4 oz).

INHALATION: Vapor inhalation is generally not a problem, unless the product is heated or misted. Exposure to vapors over an extended time period has caused throat irritation and headache. Exposure may cause nausea, vomiting, dizziness, and drowsiness. Pulmonary edema and central nervous system depression may also develop. When heated or misted and inhaled, ethylene glycol has caused rapid, involuntary eye movement and coma.

SUBCHRONIC, CHRONIC: Repeated small exposures to ethylene glycol by any route can cause severe kidney problems. Brain damage may also occur. Skin allergy can develop. Exposure may damage the developing fetus.

CARCINOGENICITY:
NTP: No ingredients listed in this section
IARC: No ingredients listed in this section
OSHA: No ingredients listed in this section
SECTION 4: FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eye lids occasionally to ensure complete rinsing. If irritation persists, call a physician.

SKIN CONTACT: Avoid contact with bare skin as prolonged contact will cause irritation. Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation occurs.

INHALATION: Avoid vapors in confined areas. The stronger the odor, faster a person will show signs of dizziness or drunkenness. Use approved breathing equipment if working in confined area.

INGESTION: Do NOT induce vomiting. Get medical attention immediately. If person is fully conscious give 1 cup or 8 oz (240 mL) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 oz (1/3-1/2 cup) (90-120 mL) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounce (1 ½ tsp) (8 mL) liquor for each 10 pounds of body weight, or 2 mL per Kg of body weight (e.g., 1.2 ounce (2 1/3 tbsn) for a 40 pound child or 36 mL for an 18 Kg child.)

NOTES TO PHYSICIAN: If several ounces (60-100 mL) of ethylene glycol have been ingested, early administration of ethanol may counter the toxic effects (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis & thiamine 100 mg plus pyridoxine 50 mg intravenously every 6 hours. If ethanol is used, a therapeutically effective blood concentration in the range of 100-150 mg/dL may be achieved by a rapid loading dose followed by a continuous intravenous infusion.

Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol (EG), di-, or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol (Brent, J. et. al, New England Journal of Medicine, Feb. 8, 2001, 344:6, p. 424-9): loading dose 15 mg/Kg intravenously, follow by bolus dose of 10 mg/Kg every 12 hour; after 48 hours, increase bolus dose to 15 mg/Kg every 12 hours. Continue fomepizole until serum methanol, EG, DEG, TEG or EGBE are undetectable.

The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. In severe poisoning, respiratory support with mechanical ventilation and positive and expiratory pressure may be required. 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**

FLASHPOINT: 322 °F TCC

FLAMMABLE LIMITS IN AIR (% by VOLUME):
Lower: 0.9.2%
Upper: 7.0%

AUTO-IGNITION TEMPERATURE: Not available

EXTINGUISHING MEDIA: Water fog, fine water spray, dry chemical, carbon dioxide, or foam. Alcohol resistant foams (ATC type) are the preferred foams. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Do NOT use a direct water stream, since this may spread the fire.

FIRE-FIGHTING INSTRUCTIONS: Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

On the drum labels, the inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

FIRE & EXPLOSION HAZARDS: Above the flashpoint, vapor-air mixtures are explosive within flammable limits noted above. Containers may explode when involved in a fire. Toxic gases and vapors may be released in a fire.

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce oxides of carbon, nitrogen, potassium, and phosphorus. Acrid smoke and irritating fumes may be produced when ethylene glycol is heated to decomposition.

NFPA CODES:
Health = 1
Flammability = 1
Reactivity = 0

Hazard Rating Scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand,
earth, or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined areas. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, flammable vapors from absorbed material.

US Regulations (CERCLA) require the reporting of spills and releases to soil, water, and air in excess of reportable quantities. (See Section 15, “Regulatory Information”.) The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

**SECTION 7: HANDLING AND STORAGE**

**HANDLING:**
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode. Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity and open flames.

**STORAGE:**
Store in a cool, well-ventilated area away from incompatible materials. Protect against the physical damage of containers. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid). Observe all warnings and precautions listed for this product.

**SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EYE/FACE PROTECTION:** Chemical splash goggles

**SKIN PROTECTION:** Chemical resistant gloves and clean body covering clothing

**RESPIRATORY PROTECTION:** If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
ENGINEERING CONTROLS: Use local and/or general exhaust ventilation to maintain airborne concentrations below airborne exposure limits. Local exhaust is generally preferred because it can control the emission of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, the most recent edition, for details.

WORK PRACTICES: An eye wash station and safety shower should be accessible in the immediate area of use.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

pH: 9.0-11.0

SPECIFIC GRAVITY: 1.13 g/mL

SOLUBILITY IN WATER: Complete

BOILING POINT: 322 °F

FLASH POINT: 232 °F TCC

FREEZING POINT: -6.5 °F (-21.4 °C)

VAPOR PRESSURE: 22 mmHg@20°C

VAPOR DENSITY (air=1): Not available

APPEARANCE AND ODOR: Red/Orange liquid with a characteristic odor

**SECTION 10: STABILITY AND REACTIVITY**

CHEMICAL STABILITY: Stable under ordinary conditions of use and storage.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Heat, flames, ignition sources, water, and incompatibles.

INCOMPATIBILITIES: Incompatible with strong oxidizers & corrosives.

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce oxides of carbon, nitrogen, potassium, and phosphorus. Acrid smoke and irritating fumes may be produced when ethylene glycol is heated to decomposition.
SECTION 11: TOXICOLOGICAL INFORMATION

ON INGREDIENTS:

<table>
<thead>
<tr>
<th>Test Material</th>
<th>Oral LD50 (rat)</th>
<th>Dermal LD50 (rabbit)</th>
<th>Inhalation LC50 (rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>4,700 mg/Kg</td>
<td>9,530 uL/Kg</td>
<td>12,111 mg/L</td>
</tr>
</tbody>
</table>

Ethylene glycol has shown teratogenic (reproductive) effects in laboratory animals.

SECTION 12: ECOLOGICAL INFORMATION

ON INGREDIENTS:

<table>
<thead>
<tr>
<th>Test Material</th>
<th>Aquatic Toxicity Data</th>
</tr>
</thead>
</table>
| Ethylene glycol     | 48 hr LC50 (Daphnia magna): 51,000 mg/L  
|                     | 96 hr LC50 (Fathead minnow): 49,000 mg/L  
|                     | 24 hr LC50 (Goldfish): >5,000 mg/L  
|                     | 96 hr LC50 (Bluegill): 27,540 mg/L  
|                     | 96 hr LC50 (Rainbow trout): 41,000 mg/L  |

SECTION 13: DISPOSAL

RCRA STATUS: Discarded product, as sold, would be not considered a RCRA Hazardous Waste.

DISPOSAL: Dispose of in accordance with local, state, and federal regulations.

SECTION 14: TRANSPORTATION

DOT CLASSIFICATION:
UN Number: Not applicable
Proper Shipping Name: Not applicable
Primary Hazard Class/Division: Not restricted
Packing Group: Not applicable
Label: None

SECTION 15: REGULATORY INFORMATION

OSHA Hazard Communication Status: Hazardous

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.
CERCLA: EPA Hazardous Substances (40 CFR 302):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CERCLA Reportable Quantity (RQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>5,000 lb</td>
</tr>
<tr>
<td>Product</td>
<td>10,000 lb</td>
</tr>
</tbody>
</table>

(Notify the EPA of spills exceeding this amount.)

SARA TITLE III (Sections 302, 311, 312, and 313):

Section 302 Extremely Hazardous Substances (40 CFR 355):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS#</th>
<th>RQ</th>
<th>TPQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 311 and 312 Health and Physical Hazards:

<table>
<thead>
<tr>
<th>Immediate</th>
<th>Delayed</th>
<th>Fire</th>
<th>Pressure</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

Section 313 Toxic Chemicals (40 CFR 372):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>Percent by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>&gt;49</td>
</tr>
</tbody>
</table>

SECTION 16: OTHER INFORMATION

HMIS RATINGS:  Health = 1  Flammability = 1  Reactivity = 0

Hazard Rating Scale:  0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

The preceding information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change, and the conditions of handling and use or misuse are beyond our control, Kroff Materials Reprocessing, Inc. makes no warranty, either express or implied, with respect to the completeness or continuing accuracy of the information contained herein, and disclaims all liability for reliance thereon. User should satisfy himself that he has all current data relevant to his particular use.