1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: ROTELLA ELC* (EXTENDED LIFE COOLANT) /CONCENTRATE
SYNONYMS: Ethylene Glycol Blend
PRODUCT USE: Engine Coolant
PRODUCT CODE: 482-005

SUPPLIER
Shell Canada Limited (SCL)
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS
Shell Emergency Number 1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER 1-613-996-6666
For general information: 1-800-661-1600
www.shell.ca

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.
*An asterisk in the product name designates a trade-mark of Shell Brands International AG. Used under license.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS Number</th>
<th>% Range</th>
<th>WHMIS Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monoethylene Glycol</td>
<td>107-21-1</td>
<td>80 - 95</td>
<td>Yes</td>
</tr>
<tr>
<td>Diethylene Glycol</td>
<td>111-46-6</td>
<td>1 - 5</td>
<td>Yes</td>
</tr>
<tr>
<td>Sodium 2-ethylhexanoate</td>
<td>19766-89-3</td>
<td>1 - 5</td>
<td>Yes</td>
</tr>
</tbody>
</table>

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Clear Red Colour Mild Odour.
Routes of Exposure: Exposure will most likely occur through skin or eye contact.
Hazard: Ethylene glycol is more acutely toxic to humans than to animals. The estimated lethal dose is 100 millilitres. Renal damage has been observed in humans following ingestion.
This product contains a component that may affect fetal development.
May be a reproductive hazard.
Harmful if swallowed.
Single high level exposures may lead to immediate and serious health effects.
Ingestion of ethylene glycol may cause vomiting, central nervous system depression,
lung congestion, kidney damage and possibly death. Ingestion of this product may
cause headache, dizziness, fatigue and central nervous system depression.
Contact with product at elevated temperatures can result in thermal burns to skin.
Due to its low vapour pressure, product is unlikely to be an inhalation hazard at
ambient temperatures. When the product is heated, vapours can irritate the
respiratory passages.

Handling: Bond and ground transfer containers and equipment to avoid static accumulation.
Wear suitable gloves and eye protection.
Avoid prolonged exposure to vapours.

For further information on health effects, see Section 11.

4. FIRST AID MEASURES

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation
occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for at least 15 minutes. If irritation
occurs and persists, obtain medical attention.

Ingestion: Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to
prevent aspiration of liquid into the lungs. Do not give anything by mouth to an
unconscious person. Obtain medical attention immediately.

Inhalation: Remove victim from further exposure and restore breathing, if required. If irritation
persists or if toxic symptoms are observed, get medical attention.

Notes to Physician: Treatment of exposure should be directed at the control of symptoms and the clinical
condition. May cause significant renal, respiratory and CNS toxicity. May cause
significant acidosis. Consider gastric lavage with protected airway, administration of
ethanol or alcohol dehydrogenase inhibitors, such as fomepizole, as antidotal
treatments. Call a doctor or Poison Control Centre for guidance. The currently
recommended medical management of diethylene glycol poisoning includes
elimination of diethylene glycol and its metabolites, correction of metabolic acidosis
and prevention of kidney injury. Gastric lavage with protected airway may be
indicated within the first one to two hours after ingestion. Competitors for the
enzyme alcohol dehydrogenase, such as ethanol or other substances, currently being
investigated are important therapy. consult a Poison Control Centre for guidance on
use. Support of respiratory function and monitoring for renal failure and
deterioration of CNS function are important. Use of syrup of ipecac is no longer
recommended. Kidney toxicity is secondary to metabolic acidosis and can generally
be recognised functionally as hematuria, or changes in urine flow; microscopic
crystals of oxalic acid in the urine often is a clinical diagnostic tool.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Firefighting Instructions: Material will not burn unless preheated. Do not use a direct stream of water as it may spread fire. Use water to cool fire exposed containers. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.

Hazardous Combustion Products: CO, aldehydes, ketones, acids and unidentified organic compounds on combustion.

6. ACCIDENTAL RELEASE MEASURES

Isolate hazard area and restrict access. Eliminate all ignition sources. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Dike and contain land spills; contain spills to water by booming. For large spills remove by mechanical means and place in containers. Adsorb residue or small spills with adsorbent material and remove to non-leaking containers for disposal. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling: Avoid prolonged or repeated contact with skin. Avoid inhalation of vapours, mists or aerosols which are produced when product is handled at elevated temperatures or mechanically generated into the air. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Do not pressurize drum containers to empty them. Do not cut, drill, grind, weld or perform similar operations on or near containers. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

The following, while appropriate for this product, is general in nature. The selection of personal protective equipment will vary depending on the conditions of use.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):
The exposure limits listed here are provided for guidance only. Consult local, provincial and territorial authorities for specific values.
Ethylene Glycol, aerosol: 100 mg/m3 (TLV/Ceiling)

Mechanical Ventilation: Concentrations in air should be maintained below the occupational exposure limit if unprotected personnel are involved. Local ventilation recommended where general ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally).

PERSONAL PROTECTIVE EQUIPMENT:
Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes.
Skin Protection: Avoid contact with skin. Impervious gloves (viton, nitrile, PVC, neoprene) should be worn at all times when handling this product. Impervious clothing (apron, coveralls)
should also be worn in confined workspaces or where the risk of skin exposure is much higher.

**Respiratory Protection:** Not normally required under intended conditions of use. Depending on airborne concentration, use either a NIOSH-approved chemical cartridge respirator with organic vapour cartridges in combination with a P95 particulate filter or use a NIOSH-approved supplied-air respirator, either self-contained or airline, operated in positive pressure mode.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear Red Colour</td>
</tr>
<tr>
<td>Odour</td>
<td>Mild Odour.</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing/Pour Point</td>
<td>Freeze Point -36 °C</td>
</tr>
<tr>
<td>Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapour Density (Air = 1)</td>
<td>2.1</td>
</tr>
<tr>
<td>Vapour Pressure (absolute)</td>
<td>0.12 mm Hg @ 20 °C</td>
</tr>
<tr>
<td>Specific Gravity (Water = 1)</td>
<td>1.12</td>
</tr>
<tr>
<td>pH</td>
<td>8 - 8.6</td>
</tr>
<tr>
<td>Flash Point</td>
<td>PMCC 127 °C</td>
</tr>
<tr>
<td>Lower Flammable Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Upper Flammable Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate (n-BuAc = 1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Partition Coefficient (log K\text{OW})</td>
<td>Not available</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Soluble</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

- **Chemically Stable:** Yes
- **Hazardous Polymerization:** No
- **Sensitive to Mechanical Impact:** No
- **Sensitive to Static Discharge:** No
- **Hazardous Decomposition Products:** When heated to decomposition, it may emit toxic fumes.
- **Incompatible Materials:** Avoid contact with strong oxidizing agents and acids.
- **Conditions of Reactivity:** None currently known.

### 11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Ingredient (or Product if not specified)</th>
<th>Toxicological Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monoethylene Glycol</td>
<td>LD50 Oral Rat = 4000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal Rabbit = 9500 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral Rabbit = 5000 mg/kg</td>
</tr>
<tr>
<td>Diethylene Glycol</td>
<td>LD50 Oral Rat = 12565 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal Rabbit = 11890 mg/kg</td>
</tr>
<tr>
<td>Sodium 2-Ethylhexanoate</td>
<td></td>
</tr>
</tbody>
</table>
Routes of Exposure: Exposure will most likely occur through skin or eye contact.

Irritancy: This product is not a primary skin irritant after exposure of short duration, is not a skin sensitiser and is not irritating to the eyes.

Acute Toxicity: Ethylene glycol is more acutely toxic to humans than to animals. The estimated lethal dose is 100 millilitres. Renal damage has been observed in humans following ingestion.

Chronic Effects: Long term dietary intake of ethylene glycol has produced bladder stones as well as kidney and liver damage and deposition of calcium salts in various tissues.

Reproductive Toxicity: 2-ethylhexanoic acid impaired female fertility in rats.

Feto/Teratogenicity: 2-ethylhexanoic acid, when administered to pregnant rats by gavage or in drinking water, caused teratogenicity and delayed postnatal development of the pups. Birth defects were also seen in the offspring of mice who were administered sodium 2-ethylhexanoate via intraperitoneal injection during pregnancy. Ethylene glycol has been shown to produce teratogenic effects in rats and mice when administered at high concentrations. In studies on mice, ingestion of ethylene glycol caused a small decrease in number of pups/litter, litters/pairs and live pup weight. Ingestion of large amounts has been shown to interfere with fertility. Mice exposed continually to high concentrations of Diethylene glycol in the drinking water showed some reproductive impairment only at doses causing decreased maternal weights. There was also some developmental toxicity (decreased fetal weights but no birth defects) in pregnant mice exposed to high concentrations that also caused maternal toxicity.

Pre-existing Conditions: Pre-existing kidney disease may be aggravated by exposure to this product.

12. ECOLOGICAL INFORMATION

Environmental Effects: Ethylene glycol is harmful to aquatic life in high concentrations. Block off drains and ditches. Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways.

Biodegradability: Potentially biodegradable. Not expected to bioconcentrate.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORT INFORMATION

Canadian Road and Rail Shipping Classification:
This product is not regulated under the Canadian Transportation of Dangerous Goods Regulations for transport by road and rail.

15. REGULATORY INFORMATION

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 by the CPR.
WHMIS Class:
- Class D2A Embryo/Fetotoxicity
- Class D2A Reproductive Toxicity
- Class D1B Acutely Toxic Material

DSL/NDSL Status:
This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.

Other Regulatory Status:
The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

16. OTHER INFORMATION

LABEL STATEMENTS

Hazard Statement: This product contains a component that may affect fetal development. May be a reproductive hazard. Harmful if swallowed. Single high level exposures may lead to immediate and serious health effects.

Handling Statement: Bond and ground transfer containers and equipment to avoid static accumulation. Wear suitable gloves and eye protection. Avoid prolonged exposure to vapours.

First Aid Statement: Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.

Revisions: This MSDS has been reviewed and updated. Changes have been made to: Section 1 Section 3 Section 4 Section 11 Section 12