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|---|--|---------------------------|
|  | | Page: 1 |
| SAFETY DATA SHEET | | Revision Date: 05/22/2017 |
| | | Print Date: 6/2/2017 |
| | | SDS Number: R0368894 |
| Zerex™ HD EXTENDED LIFE Antifreeze Coolant ZXED2 | | Version: 1.3 |

29 CFR 1910.1200 (OSHA HazCom 2012)

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Trade name : Zerex™ HD EXTENDED LIFE Antifreeze Coolant


| | |
|---|---|
| Details of the supplier of the safety data sheet Valvoline LLC 100 Valvoline Way Lexington, KY 40509 United States of America (USA) 1-800-TEAMVAL | Emergency telephone number 1-800-VALVOLINE (1-800-825-8654) Regulatory Information Number 1-800-TEAMVAL Product Information 1-800-TEAMVAL |
|---|---|

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4
 Skin irritation : Category 2
 Eye irritation : Category 2A
 Specific target organ systemic toxicity - repeated exposure (Oral) : Category 2 (Kidney, Liver)

GHS label elements

Hazard pictograms : 

Signal Word : Warning

Hazard Statements : Harmful if swallowed.
 Causes skin irritation.
 Causes serious eye irritation.
 May cause damage to organs (Kidney, Liver) through prolonged or repeated exposure if swallowed.

Precautionary Statements : **Prevention:**

SAFETY DATA SHEET

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
 Wash skin thoroughly after handling.
 Do not eat, drink or smoke when using this product.
 Wear protective gloves/ eye protection/ face protection.

Response:

IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.

IF ON SKIN: Wash with plenty of soap and water.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Get medical advice/ attention if you feel unwell.

If skin irritation occurs: Get medical advice/ attention.

If eye irritation persists: Get medical advice/ attention.

Take off contaminated clothing and wash before reuse.

Disposal:

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

Other hazards


None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture


Hazardous components

| Chemical name | CAS-No. | Classification | Concentration (%) |
|---------------------|-----------|---|-------------------|
| ETHYLENE GLYCOL | 107-21-1 | Acute Tox. 4; H302 STOT RE 2; H373 | 92.2622 |
| DIETHYLENE GLYCOL | 111-46-6 | Acute Tox. 4; H302 STOT RE 2; H373 | 4.6147 |
| POTASSIUM HYDROXIDE | 1310-58-3 | Met. Corr. 1; H290 Acute Tox. 4; H302 Skin Corr. 1A; H314 Eye Dam. 1; H318 | 2.7008 |

| | | |
|---|--|---------------------------|
|  | | Page: 3 |
| SAFETY DATA SHEET | | Revision Date: 05/22/2017 |
| | | Print Date: 6/2/2017 |
| | | SDS Number: R0368894 |
| Zerex™ HD EXTENDED LIFE Antifreeze Coolant ZXED2 | | Version: 1.3 |

SECTION 4. FIRST AID MEASURES

- General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.
- If inhaled : If breathed in, move person into fresh air.
If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.
- In case of skin contact : Remove contaminated clothing. If irritation develops, get medical attention.
If on skin, rinse well with water.
Wash contaminated clothing before re-use.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
- If swallowed : Obtain medical attention.
Rinse mouth with water.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
- Most important symptoms and effects, both acute and delayed : Effects of acute ethylene glycol poisoning appear in three fairly distinct stages. The initial stage occurs shortly after exposure, lasts 6-12 hours, and is characterized by central nervous system effects (transient exhilaration, nausea, vomiting, and in severe cases, coma, convulsions, and possible death). The second stage lasts from 12-36 hours after exposure and is initiated by the onset of coma. This phase is characterized by tachypnea, tachycardia, mild hypotension, cyanosis, and in severe cases, pulmonary edema, bronchopneumonia, cardiac enlargement, and congestive failure. The final stage occurs 24-72 post-exposure and is characterized by renal failure, ranging from a mild increase in blood urea nitrogen and creatinine followed by recovery, to complete anuria with acute tubular necrosis that can lead to death. Oxaluria is found in most cases. The most significant laboratory finding in ethylene glycol intoxication is severe metabolic acidosis.
- Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:
stomach or intestinal upset (nausea, vomiting, diarrhea)
irritation (nose, throat, airways)
Cough
pain in the abdomen and lower back

| | | |
|---|--|---------------------------|
|  | | Page: 4 |
| SAFETY DATA SHEET | | Revision Date: 05/22/2017 |
| | | Print Date: 6/2/2017 |
| | | SDS Number: R0368894 |
| Zerex™ HD EXTENDED LIFE Antifreeze Coolant | | Version: 1.3 |
| ZXED2 | | |

cyanosis (causes blue coloring of the skin and nails from lack of oxygen)
 lung edema (fluid buildup in the lung tissue)
 acute kidney failure (sudden slowing or stopping of urine production)
 Convulsions
 Harmful if swallowed.
 Causes skin irritation.
 Causes serious eye irritation.

Notes to physician : This product contains ethylene glycol. Ethanol decreases the metabolism of ethylene glycol to toxic metabolites. Ethanol should be administered as soon as possible in cases of severe poisoning since the elimination half-life of ethylene glycol is 3 hours. If medical care will be delayed several hours, give the patient three to four 1-ounce oral "shots" of 86-proof or higher whiskey before or during transport to the hospital. Fomepizole (4-methylpyrazole) is an effective antagonist of alcohol dehydrogenase, and as such, may be used as an antidote in the treatment of ethylene glycol poisoning. Hemodialysis effectively removes ethylene glycol and its metabolites from the body.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
 Water spray
 Foam
 Carbon dioxide (CO₂)
 Dry chemical

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Alcohols
 Aldehydes
 carbon dioxide and carbon monoxide
 ethers
 toxic fumes
 Hydrocarbons
 potassium oxide

Specific extinguishing methods :

**SAFETY DATA SHEET**

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

Product is compatible with standard fire-fighting agents.

Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

Other information : Comply with all applicable federal, state, and local regulations.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Do not breathe vapours/dust.
Do not smoke.
Container hazardous when empty.
Avoid contact with skin and eyes.
Smoking, eating and drinking should be prohibited in the application area.
For personal protection see section 8.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

SAFETY DATA SHEET

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

Components with workplace control parameters

| Components | CAS-No. | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis |
|---------------------|-----------|-------------------------------|--|-----------|
| ETHYLENE GLYCOL | 107-21-1 | C | 100 mg/m3 Aerosol only | ACGIH |
| | | C | 50 ppm 125 mg/m3 | OSHA P0 |
| | | C | 40 ppm 100 mg/m3 Vapour | CAL PEL |
| DIETHYLENE GLYCOL | 111-46-6 | TWA | 10 mg/m3 | US WEEL |
| POTASSIUM HYDROXIDE | 1310-58-3 | C | 2 mg/m3 | ACGIH |
| | | C | 2 mg/m3 | NIOSH REL |
| | | C | 2 mg/m3 | OSHA P0 |
| | | C | 2 mg/m3 | CAL PEL |

Engineering measures : Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Personal protective equipment

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection : Wear as appropriate:
Impervious clothing
Safety shoes
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Discard gloves that show tears, pinholes, or signs of wear.
Wear resistant gloves (consult your safety equipment supplier).

Hygiene measures : Wash hands before breaks and at the end of workday.
When using do not eat or drink.
When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state : liquid

Colour : red

SAFETY DATA SHEET

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

- Odour : No data available
- Odour Threshold : No data available
- pH : Average 9.2
- Melting point/freezing point : No data available
- Boiling point/boiling range : 330 °F / 166 °C
(1013 hPa)
- Flash point : > 250 °F / > 121 °C
- Evaporation rate : No data available
- Flammability (solid, gas) : No data available
- Upper explosion limit : No data available
- Lower explosion limit : No data available
- Vapour pressure : No data available
- Relative vapour density : No data available
- Relative density : No data available
- Density : 1.126 g/cm³ (15.6 °C)

- Solubility(ies)
 - Water solubility : No data available
 - Solubility in other solvents : No data available
- Partition coefficient: n-octanol/water : No data available
- Thermal decomposition : No data available
- Viscosity
 - Viscosity, dynamic : No data available
 - Viscosity, kinematic : No data available
- Oxidizing properties : No data available

SECTION 10. STABILITY AND REACTIVITY

**SAFETY DATA SHEET**

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

| | |
|------------------------------------|--|
| Reactivity | : No decomposition if stored and applied as directed. |
| Chemical stability | : Stable under recommended storage conditions. |
| Possibility of hazardous reactions | : Product will not undergo hazardous polymerization. |
| Conditions to avoid | : Keep away from heat, flame, sparks and other ignition sources. excessive heat |
| Incompatible materials | : Acids Alcohols Aldehydes Alkali metals Alkaline earth metals aluminum Amines Bases chlorinated solvents halogenated hydrocarbons Metals strong alkalis Strong oxidizing agents Sulphur compounds water Zinc |
| Hazardous decomposition products | Alcohols Aldehydes carbon dioxide and carbon monoxide ethers Hydrocarbons Organic acids potassium oxide ketones |

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation
Skin contact
Eye Contact
Ingestion

Acute toxicity

Harmful if swallowed.

Product:

Acute oral toxicity :

**SAFETY DATA SHEET**

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

Remarks: Ingestion of medications contaminated with diethylene glycol has caused kidney failure and death in humans. Products containing diethylene glycol should be considered toxic by ingestion.

Acute dermal toxicity : Remarks: Skin absorption of this material (or a component) may be increased through injured skin.

Components:**ETHYLENE GLYCOL:**

Acute oral toxicity : LD0 (Human): Estimated 1.56 g/kg

Assessment: The component/mixture is classified as acute oral toxicity, category 4.

Acute inhalation toxicity : LC50 (Rat): 10.9 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Assessment: No adverse effect has been observed in acute inhalation toxicity tests.

Acute dermal toxicity : LD50 (Rabbit): 9,530 mg/kg

DIETHYLENE GLYCOL:

Acute oral toxicity : LD50 (Human): Expected 1,120 mg/kg
Target Organs: Kidney

Acute inhalation toxicity : LC50 (Rat): > 4.6 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: No adverse effect has been observed in acute inhalation toxicity tests.

Acute dermal toxicity : LD50 (Rabbit): 13,300 mg/kg

POTASSIUM HYDROXIDE:

Acute oral toxicity : LD50 (Rat): 333 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks: May cause skin irritation and/or dermatitis.

Components:**ETHYLENE GLYCOL:**

Species: Rabbit

Result: No skin irritation

**SAFETY DATA SHEET**

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

DIETHYLENE GLYCOL:

Species: Human

Result: Slight, transient irritation

POTASSIUM HYDROXIDE:

Species: Rabbit

Result: Corrosive after 3 minutes or less of exposure

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Remarks: Vapours may cause irritation to the eyes, respiratory system and the skin., Causes serious eye irritation.

Components:**ETHYLENE GLYCOL:**

Result: Slight, transient irritation

DIETHYLENE GLYCOL:

Species: Rabbit

Result: Slight, transient irritation

POTASSIUM HYDROXIDE:

Species: Rabbit

Result: Corrosive

Respiratory or skin sensitisation

Skin sensitisation: Not classified based on available information.

Respiratory sensitisation: Not classified based on available information.

Components:**ETHYLENE GLYCOL:**

Test Type: Maximisation Test

Species: Guinea pig

Assessment: Does not cause skin sensitisation.

DIETHYLENE GLYCOL:

Test Type: Maximisation Test

Species: Guinea pig

Method: Directive 67/548/EEC, Annex V, B.6.

Result: Did not cause sensitisation on laboratory animals.

POTASSIUM HYDROXIDE:

Test Type: Maximisation Test

Species: Guinea pig

Assessment: Does not cause skin sensitisation.

Germ cell mutagenicity

Not classified based on available information.

Components:

**SAFETY DATA SHEET**

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

ETHYLENE GLYCOL:

Genotoxicity in vitro

: Test Type: Ames test
Test species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

DIETHYLENE GLYCOL:

Genotoxicity in vitro

: Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

: Test species: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 479
Result: negative
GLP: yes

Genotoxicity in vivo

: Test Type: In vivo micronucleus test
Test species: Mouse
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Components:**ETHYLENE GLYCOL:**

Exposure routes: Ingestion

Target Organs: Kidney, Liver

Assessment: May cause damage to organs through prolonged or repeated exposure.

DIETHYLENE GLYCOL:

Exposure routes: Ingestion

Target Organs: Kidney

Assessment: May cause damage to organs through prolonged or repeated exposure.

Aspiration toxicity

Not classified based on available information.

Product:

No aspiration toxicity classification

Experience with human exposure**Components:**

**SAFETY DATA SHEET**

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

DIETHYLENE GLYCOL:

Liver

Further information**Product:**

Remarks: No data available

Components:

POTASSIUM HYDROXIDE:

Remarks: No data available

Carcinogenicity:**IARC**

Group 2A: Probably carcinogenic to humans

SODIUM NITRITE 7632-00-0

SODIUM NITRATE 7631-99-4

OSHA

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Product:**

Ecotoxicology Assessment

Acute aquatic toxicity : Acute aquatic toxicity Category 3; Harmful to aquatic life.

Chronic aquatic toxicity : Not classified based on available information.

Components:

ETHYLENE GLYCOL:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 27,540 mg/l
Exposure time: 96 h
Test Type: static testLC50 (Pimephales promelas (fathead minnow)): 8,050 mg/l
Exposure time: 96 hToxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): > 10,000 mg/l
Exposure time: 48 h
Test Type: static test

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (green algae)): 6,500 - 13,000 mg/l

SAFETY DATA SHEET

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

End point: Growth inhibition
Exposure time: 7 Days

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 32,000 mg/l
Exposure time: 7 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 24,000 mg/l
Exposure time: 7 d

DIETHYLENE GLYCOL:

Toxicity to fish : LC50 (Fathead minnow (Pimephales promelas)): 75,210 mg/l
Exposure time: 96 h
Test Type: flow-through test

Toxicity to daphnia and other aquatic invertebrates : LC50 (Water flea (Daphnia magna)): > 10,000 mg/l
Exposure time: 24 h
Test Type: static test
Method: DIN 38412

POTASSIUM HYDROXIDE:

Toxicity to fish : LC50 (Gambusia affinis (Mosquito fish)): 80 mg/l
Exposure time: 96 h
Test Type: static test

Ecotoxicology Assessment

Chronic aquatic toxicity : Not expected to cause long-term toxicity to fish., Not expected to cause long-term toxicity to aquatic invertebrates., Not expected to cause long-term toxicity to aquatic plants.

Persistence and degradability

Components:

ETHYLENE GLYCOL:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 90 - 100 %
Exposure time: 10 d
Method: OECD Test Guideline 301

DIETHYLENE GLYCOL:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 70 - 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

POTASSIUM HYDROXIDE:

Biodegradability : Result: The methods for determining biodegradability are not applicable to inorganic substances.

No data available

Bioaccumulative potential

Components:

SAFETY DATA SHEET

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

ETHYLENE GLYCOL:

Bioaccumulation : Species: Crayfish (Procambarus)
 Bioconcentration factor (BCF): 0.27
 Exposure time: 61 d
 Concentration: 1000 mg/l
 Method: Flow through

Partition coefficient: n-octanol/water : log Pow: -1.36

DIETHYLENE GLYCOL:

Bioaccumulation : Species: Leuciscus idus (Golden orfe)
 Bioconcentration factor (BCF): 100

Partition coefficient: n-octanol/water : log Pow: -1.47

No data available

Mobility in soil

Components:

No data available

Other adverse effects

No data available

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Harmful to aquatic life.

Components:

POTASSIUM HYDROXIDE:

Additional ecological information : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

General advice : The product should not be allowed to enter drains, water courses or the soil.
 Do not contaminate ponds, waterways or ditches with chemical or used container.
 Send to a licensed waste management company.

 Dispose of in accordance with all applicable local, state and federal regulations.

Contaminated packaging : Empty remaining contents.
 Dispose of as unused product.
 Empty containers should be taken to an approved waste handling site for recycling or disposal.



SAFETY DATA SHEET

Revision Date: 05/22/2017

Print Date: 6/2/2017

SDS Number: R0368894

Zerex™ HD EXTENDED LIFE Antifreeze Coolant

Version: 1.3

ZXED2

Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

REGULATION

| ID NUMBER | PROPER SHIPPING NAME | *HAZARD CLASS | SUBSIDIARY HAZARDS | PACKING GROUP | MARINE POLLUTANT / LTD. QTY. |
|-----------|----------------------|---------------|--------------------|---------------|------------------------------|
|-----------|----------------------|---------------|--------------------|---------------|------------------------------|

U.S. DOT - ROAD

| |
|---------------------|
| Not dangerous goods |
|---------------------|

CFR_RAIL_C

| |
|---------------------|
| Not dangerous goods |
|---------------------|

U.S. DOT - INLAND WATERWAYS

| |
|---------------------|
| Not dangerous goods |
|---------------------|

TDG_ROAD_C

| |
|---------------------|
| Not dangerous goods |
|---------------------|

TDG_RAIL_C

| |
|---------------------|
| Not dangerous goods |
|---------------------|

TDG_INWT_C

| |
|---------------------|
| Not dangerous goods |
|---------------------|

INTERNATIONAL MARITIME DANGEROUS GOODS

| |
|---------------------|
| Not dangerous goods |
|---------------------|

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

| |
|---------------------|
| Not dangerous goods |
|---------------------|

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

| |
|---------------------|
| Not dangerous goods |
|---------------------|

MX_DG

| |
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| Not dangerous goods |
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| | |
|---|---------------------------|
| SAFETY DATA SHEET | Revision Date: 05/22/2017 |
| | Print Date: 6/2/2017 |
| | SDS Number: R0368894 |
| Zerex™ HD EXTENDED LIFE Antifreeze Coolant ZXED2 | Version: 1.3 |

*ORM = ORM-D, CBL = COMBUSTIBLE LIQUID

| | |
|------------------|----|
| Marine pollutant | no |
|------------------|----|

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15. REGULATORY INFORMATION

**EPCRA - Emergency Planning and Community Right-to-Know Act
CERCLA Reportable Quantity**

| Components | CAS-No. | Component RQ (lbs) | Calculated product RQ (lbs) |
|-----------------|----------|--------------------|-----------------------------|
| ETHYLENE GLYCOL | 107-21-1 | 5000 | 5419 |

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

SARA 313
ETHYLENE GLYCOL 107-21-1 92.26 %

California Prop 65 WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
ETHYLENE GLYCOL 107-21-1

The components of this product are reported in the following inventories:

- DSL : All components of this product are on the Canadian DSL
- AICS : On the inventory, or in compliance with the inventory
- ENCS : Not in compliance with the inventory
- KECI : On the inventory, or in compliance with the inventory
- PICCS : On the inventory, or in compliance with the inventory
- IECSC : On the inventory, or in compliance with the inventory
- TSCA : On TSCA Inventory

Inventories

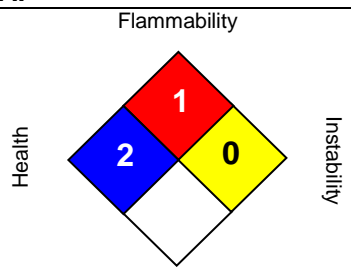
| | | |
|---|--|---------------------------|
| SAFETY DATA SHEET | | Revision Date: 05/22/2017 |
| | | Print Date: 6/2/2017 |
| | | SDS Number: R0368894 |
| Zerex™ HD EXTENDED LIFE Antifreeze Coolant ZXED2 | | Version: 1.3 |

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

Revision Date: 05/22/2017

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|--|--|---------------|-----------|---------------------|----------|------------------------|----------|
| <p>NFPA:</p>  <p>Flammability</p> <p>Health</p> <p>Instability</p> <p>Special hazard.</p> | <p>HMIS III:</p> <table border="1"> <tr> <td>HEALTH</td> <td>2*</td> </tr> <tr> <td>FLAMMABILITY</td> <td>1</td> </tr> <tr> <td>PHYSICAL HAZARD</td> <td>0</td> </tr> </table> <p>0 = not significant, 1 =Slight, 2 = Moderate, 3 = High 4 = Extreme, * = Chronic</p> | HEALTH | 2* | FLAMMABILITY | 1 | PHYSICAL HAZARD | 0 |
| HEALTH | 2* | | | | | | |
| FLAMMABILITY | 1 | | | | | | |
| PHYSICAL HAZARD | 0 | | | | | | |


NFPA Flammable and Combustible Liquids Classification
Combustible Liquid Class IIIB

Full text of H-Statements

- H290 May be corrosive to metals.
- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H318 Causes serious eye damage.
- H373 May cause damage to organs through prolonged or repeated exposure if swallowed.

Sources of key data used to compile the Safety Data Sheet
Valvoline internal data including own and sponsored test reports
The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Valvoline's Environmental Health and Safety Department (1-800-VALVOLINE).

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|  | | Page: 18 |
| SAFETY DATA SHEET | | Revision Date: 05/22/2017 |
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| | | SDS Number: R0368894 |
| Zerex™ HD EXTENDED LIFE Antifreeze Coolant | | Version: 1.3 |
| ZXED2 | | |

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet :

ACGIH : American Conference of Industrial Hygienists

BEI : Biological Exposure Index

CAS : Chemical Abstracts Service (Division of the American Chemical Society).

CMR : Carcinogenic, Mutagenic or Toxic for Reproduction

FG : Food grade

GHS : Globally Harmonized System of Classification and Labeling of Chemicals.

H-statement : Hazard Statement

IATA : International Air Transport Association.

IATA-DGR : Dangerous Goods Regulation by the "International Air Transport Association" (IATA).

ICAO : International Civil Aviation Organization

ICAO-TI (ICAO) : Technical Instructions by the "International Civil Aviation Organization"

IMDG : International Maritime Code for Dangerous Goods

ISO : International Organization for Standardization

logPow : octanol-water partition coefficient

LCxx : Lethal Concentration, for xx percent of test population

LDxx : Lethal Dose, for xx percent of test population.

ICxx : Inhibitory Concentration for xx of a substance

Ecxx : Effective Concentration of xx

N.O.S.: Not Otherwise Specified

OECD : Organization for Economic Co-operation and Development

OEL : Occupational Exposure Limit

P-Statement : Precautionary Statement

PBT : Persistent , Bioaccumulative and Toxic

PPE : Personal Protective Equipment

STEL : Short-term exposure limit

STOT : Specific Target Organ Toxicity

TLV : Threshold Limit Value

TWA : Time-weighted average

vPvB : Very Persistent and Very Bioaccumulative

WEL : Workplace Exposure Level

CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act

DOT : Department of Transportation

FIFRA : Federal Insecticide, Fungicide, and Rodenticide Act

HMIRC : Hazardous Materials Information Review Commission

HMIS : Hazardous Materials Identification System

NFPA : National Fire Protection Association

NIOSH : National Institute for Occupational Safety and Health

OSHA : Occupational Safety and Health Administration

PMRA : Health Canada Pest Management Regulatory Agency

RTK : Right to Know

WHMIS : Workplace Hazardous Materials Information System