SAFETY DATA SHEET

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Zerex™ HD EXTENDED LIFE ANTIFREEZE COOLANT

ZXED2

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Ashland P.O. Box 2219 Columbus, OH 43216	Regulatory Information Number Telephone Emergency telephone number	1-800-325-3751 614-790-3333 1-800-ASHLAND (1-800-274-5263)
Product name	Zerex™ HD EXTENDED LIFE ANTIFREEZE COOLANT	
Product code	ZXED2	

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, red

WARNING! MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF SWALLOWED.

Potential Health Effects

Exposure routes
Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact
May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

Skin contact
May cause slight skin irritation.

Ingestion
Swallowing this material may be harmful. Liver, kidney and brain damage in humans has resulted from swallowing lethal or near-lethal amounts of ethylene glycol.

Inhalation
It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition
Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, Skin, lung (for example, asthma-like conditions), Liver, Kidney, Central nervous system, spleen, bone, Exposure to this material may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias.

Symptoms

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, discomfort in the chest, central nervous system excitation (giddiness, liveliness, light-headed feeling) followed by central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, involuntary eye movement, high blood pressure, chest pain, pain in the abdomen and lower back, 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), liver damage, lung damage, damage to the mouth, throat, and/or airways, Convulsions, coma

Target Organs

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, anemia, reproductive effects, effects on male fertility, bone damage, spleen damage, kidney damage, liver damage, central nervous system damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:, central nervous system effects, joint pain (gout), liver damage, kidney damage

Carcinogenicity

This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

Reproductive hazard

Ethylene glycol has caused birth defects in animal studies at high oral doses. However, it did not cause harm to the pregnant animal or to the fetus when applied to the skin of the pregnant animal., This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain., 2-Ethylhexanoic acid has been shown to cause birth defects in laboratory animal studies. The relevance of these findings to humans is uncertain.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	CAS-No. / Trade Secret No.	Concentration
ETHYLENE GLYCOL	107-21-1	>=90-<=100%
DIETHYLENE GLYCOL	111-46-6	>=1.5-<5%
2-ETHYLHEXANOIC ACID	149-57-5	>=1.5-<5%
POTASSIUM HYDROXIDE	1310-58-3	>=1.5-<5%
SODIUM MOLYBDATE	7631-95-0	>=0.1-<0.5%

4. FIRST AID MEASURES

Eyes

If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention. Do not remove the victim from water access for transport to a medical facility unless instructed to do so by qualified medical personnel. If possible, continue flushing the eye gently with water while transporting the victim.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Notes to physician

Hazards: 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 tachypnia, 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. Ingestion or other significant exposure to this material (or a component) may cause metabolic acidosis.

Treatment: 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. 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, diethylene glycol and methanol poisoning.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Dry chemical, Carbon dioxide (CO2), Water spray

Hazardous combustion products

Alcohols, Aldehydes, carbon dioxide and carbon monoxide, ethers, Hydrocarbons, potassium oxide, toxic fumes

Precautions for fire-fighting

Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). DO NOT direct a solid stream of water or foam into hot, burning pools of liquid since this may cause frothing and increase fire intensity. Frothing can be violent and possibly endanger any firefighter standing too close to the burning liquid. Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning material with water used for cooling purposes.

NFPA Flammable and Combustible Liquids Classification

Combustible Liquid Class IIIB

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Environmental precautions

Prevent spreading over a wide area (e.g. by containment or oil barriers). Do not let product enter drains. Do not flush into surface water or sanitary sewer system.

Methods for cleaning up

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

Other information

Comply with all applicable federal, state, and local regulations.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Storage

Store in a cool, dry, ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

ETHYLENE GLYCOL		**107-21-1**	
ACGIH	Ceiling Limit Value:	100 mg/m3	Aerosol.
DIETHYLENE GLYCOL		**111-46-6**	
WEEL	time weighted average	10 mg/m3	
2-ETHYLHEXANOIC ACID		**149-57-5**	
ACGIH	time weighted average	5 mg/m3	Inhalable fraction and vapor
POTASSIUM HYDROXIDE		**1310-58-3**	
ACGIH	Ceiling Limit Value:	2 mg/m3	
NIOSH	Recommended exposure limit (REL):	2 mg/m3	
SODIUM MOLYBDATE		**7631-95-0**	
ACGIH	time weighted average	0.5 mg/m3	Respirable fraction.
OSHA Z1	Permissible exposure limit	5 mg/m3	

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

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.

Eye protection

Not required under normal conditions of use. Wear splash-proof safety goggles if material could be misted or splashed into eyes.

Skin and body protection

Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for your use.
Wear resistant gloves (consult your safety equipment supplier).

Respiratory protection

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Colour	red
Boiling point/boiling range	330 °F / 166 °C @ 760.00 mmHg
pH	(Average) 9.2
Flash point	> 250 °F / > 121 °C
Density	1.126 g/cm3 @ 60.1 °F / 15.6 °C

10. STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

Heat, flames and sparks., Exposure to moisture.

Incompatible products

Acids, Alcohols, Aldehydes, Alkali metals, Alkaline earth metals, Amines, Ammonia, Bases, chlorinated solvents, chromium trioxide, Copper, Copper alloys, halogenated hydrocarbons, Reducing agents, strong alkalis, Strong oxidizing agents, Sulphur compounds, Zinc

Hazardous decomposition products

Alcohols, Aldehydes, carbon dioxide and carbon monoxide, ethers, Hydrocarbons, Organic acids, potassium oxide, ketones

Hazardous reactions

Product will not undergo hazardous polymerization.

11. TOXICOLOGICAL INFORMATION

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

Product

Acute oral toxicity : No data available

Acute inhalation toxicity	:	No data available
Acute dermal toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/eye irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Target Organ Systemic Toxicant - Repeated exposure	:	Target Organs: Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, anemia, reproductive effects, effects on male fertility, bone damage, spleen damage, kidney damage, liver damage, central nervous system damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:, central nervous system effects, joint pain (gout), liver damage, kidney damage

Components:

ETHYLENE GLYCOL:

Acute oral toxicity	:	LD 50 Rat: 6,140 mg/kg LD50 Human: Estimated 1.56 g/kg The component/mixture is classified as acute oral toxicity, category 4.
Acute inhalation toxicity	:	LC 50 Rat: 10.9 mg/l Exposure time: 1 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD 50 Rabbit: 9,530 mg/kg
STOT - repeated exposure	:	Exposure routes: Ingestion Target Organs: Kidney, Liver Assessment: May cause damage to organs through prolonged or repeated exposure.

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 No adverse effect has been observed in acute inhalation toxicity tests.
Acute dermal toxicity	:	LD 50 Rabbit: 13,300 mg/kg
Respiratory or skin sensitisation	:	Test Method: Maximisation Test (GPMT) Species: guinea pig Result: Did not cause sensitisation on laboratory animals. Method: Directive 67/548/EEC, Annex V, B.6.

Germ cell mutagenicity

Genotoxicity in vitro	:	Type: Ames test with and without metabolic activation Result: negative Method: OECD Test Guideline 471 GLP: yes
	:	Test species: Chinese hamster ovary cells with and without metabolic activation Result: negative Method: OECD Test Guideline 479 GLP: yes
Genotoxicity in vivo	:	Type: In vivo micronucleus test Test species: mouseMethod: OECD Test Guideline 474 GLP: yes Result: negative
STOT - repeated exposure	:	Exposure routes: Ingestion Target Organs: Kidney Assessment: May cause damage to organs through prolonged or repeated exposure.
Experience with human exposure	:	Liver

2-ETHYLHEXANOIC ACID:

Acute oral toxicity	:	LD 50 Rat, male: 3 g/kg

LD 50 Rat, female: 2,043 mg/kg

Acute inhalation toxicity	:	LC0 Rat: 0.11 mg/l Exposure time: 8 h Method: OECD Test Guideline 403
Acute dermal toxicity	:	LD 50 Rat: > 2,000 mg/kg

POTASSIUM HYDROXIDE:

Acute oral toxicity	:	LD 50 Rat: 333 mg/kg
Acute dermal toxicity	:	LD 50 Rabbit: 1,260 mg/kg

SODIUM MOLYBDATE:

Acute oral toxicity	:	LD 50 Rat: > 2,000 mg/kg Not classified as acutely toxic by ingestion under GHS.
Acute inhalation toxicity	:	LC 50 Rat: > 3.92 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 No adverse effect has been observed in acute inhalation toxicity tests.
Acute dermal toxicity	:	LD50 rat: > 2,000 mg/kg Method: OECD Test Guideline 402 No adverse effect has been observed in acute dermal toxicity tests.
Respiratory or skin sensitisation	:	Test Method: Maximisation Test (GPMT) Species: guinea pig Result: Did not cause sensitisation on laboratory animals. Method: OECD Test Guideline 406

12. ECOLOGICAL INFORMATION

Ecotoxicity
Product:

No data available

Components:

ETHYLENE GLYCOL:

Toxicity to fish	:	LC 50 (Bluegill (Lepomis macrochirus)): 27,540 mg/l Exposure time: 96 h Method: Static Mortality LC 50 (Fathead minnow (Pimephales promelas)): 8,050 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	LC 50 (Water flea (Daphnia magna)): > 10,000 mg/l Exposure time: 48 h Test Method: static test

DIETHYLENE GLYCOL:

Toxicity to fish	:	LC 50 (Fathead minnow (Pimephales promelas)): 75,210 mg/l Exposure time: 96 h Test Method: flow-through test
Toxicity to daphnia and other aquatic invertebrates	:	LC 50 (Water flea (Daphnia magna)): > 10,000 mg/l Exposure time: 24 h Test Method: static test Method: DIN 38412

2-ETHYLHEXANOIC ACID:

Toxicity to fish	:	LC 50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Test Method: static test
Toxicity to daphnia and other aquatic invertebrates	:	EC 50 (Water flea (Daphnia magna)): 85.4 mg/l Exposure time: 48 h Test Method: static test
Toxicity to algae	:	EC 50 (Desmodesmus subspicatus (green algae)): 49.3 mg/l Exposure time: 72 h Test Method: static test

POTASSIUM HYDROXIDE:

Toxicity to fish	:	LC 50 (Western mosquitofish (Gambusia affinis)): 80 mg/l Exposure time: 96 h

Method: Static
Mortality

Persistence and degradability

Product:

No data available

Components:

DIETHYLENE GLYCOL:

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

2-ETHYLHEXANOIC ACID:

Biodegradability	:	Biodegradation: 99 % Exposure time: 28 d Readily biodegradable

Bioaccumulative potential

Product:

No data available

Components:

ETHYLENE GLYCOL:

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

2-ETHYLHEXANOIC ACID:

Partition coefficient: n-octanol/water	:	log Pow: 2.64

SODIUM MOLYBDATE:

Bioaccumulation	:	Species: Blue-green algae (Anabaena oscillarioides) Exposure time: 7 d Concentration: 0.025 mg/l Bioconcentration factor (BCF): 7 - 24 Method: Static

Mobility in soil

Product:

No data available

Components:

ETHYLENE GLYCOL:

Surface tension	:	48.4 mN/m

DIETHYLENE GLYCOL:

Surface tension	:	48.5 mN/m

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

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

14. TRANSPORT INFORMATION

REGULATION

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

U.S. DOT - ROAD

Not dangerous goods

U.S. DOT - RAIL

Not dangerous goods

U.S. DOT - INLAND WATERWAYS

Not dangerous goods

TRANSPORT CANADA - ROAD

Not dangerous goods

TRANSPORT CANADA - RAIL

Not dangerous goods

TRANSPORT CANADA - INLAND WATERWAYS

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

MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES

Not dangerous goods

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

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.

15. REGULATORY INFORMATION

California Prop. 65

Proposition 65 warnings are not required for this product based on the results of a risk assessment.	

SARA Hazard Classification
SARA 311/312 Classification
Acute Health Hazard
Chronic Health Hazard

SARA 313 Component(s)

ETHYLENE GLYCOL	91.53 %

New Jersey RTK Label Information

ETHYLENE GLYCOL	107-21-1
DIETHYLENE GLYCOL	111-46-6
2-ETHYLHEXANOIC ACID	149-57-5
POTASSIUM HYDROXIDE	1310-58-3
WATER	7732-18-5

Pennsylvania RTK Label Information

ETHYLENE GLYCOL	107-21-1
DIETHYLENE GLYCOL	111-46-6
2-ETHYLHEXANOIC ACID	149-57-5
POTASSIUM HYDROXIDE	1310-58-3

Notification status

US. Toxic Substances Control Act	y (positive listing)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	y (positive listing)
Australia. Industrial Chemical (Notification and Assessment) Act	y (positive listing)
Japan. ENCS - Existing and New Chemical Substances Inventory	n (Negative listing)
Korea. Toxic Chemical Control Law (TCCL) List	y (positive listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	y (positive listing)
China. Inventory of Existing Chemical Substances	y (positive listing)

Reportable quantity - Product

US. EPA CERCLA Hazardous Substances (40 CFR 302)	5462 lbs

Reportable quantity-Components

ETHYLENE GLYCOL	107-21-1	5000 lbs

	HMIS	NFPA
Health	2*	2
Flammability	1	1
Physical hazards	0	
Instability		0
Specific Hazard	--	--

16. OTHER INFORMATION

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 MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

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