SAFETY DATA SHEET

SDS00362
DOWTHERM SR-1

Preparation Date: 18/Sep/2020 Version: 5

1. IDENTIFICATION

Product identifier

Product Name DOWTHERM SR-1

Other means of identification

SDS Number SDS00362

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended Use Heat transfer fluids For non-evaporative closed loop systems. Do not use if there is the possibility of incidental contact to food and/or potable water.

Restricted Uses No information available

Initial Supplier Identifier
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC V6X 1W5
Telephone: 1-866-686-4827

Emergency telephone number

24 Hour Emergency Phone Number (CANUTEC): 1-888-226-8832 (1-888-CAN-UTEC)

2. HAZARD IDENTIFICATION

Hazardous Classification of the substance or mixture

Acute toxicity - Oral	Category 4
Specific target organ toxicity (single exposure)	Category 1 Category 3
Specific target organ toxicity (repeated exposure)	Category 2

Label elements

Hazard pictograms

Signal Word: Warning

Hazard statements
Harmful if swallowed
Causes damage to organs
May cause damage to organs through prolonged or repeated exposure
May cause respiratory irritation

Precautionary Statements

Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray

Response
Get medical advice/attention if you feel unwell
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
Rinse mouth
Do NOT induce vomiting

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish

Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Disposal
Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable.

Mixture

Chemical Name	CAS No	Weight-% (W/W)	Synonyms
Ethylene Glycol	107-21-1	80 - 100%	Ethylene Glycol
Water	7732-18-5	1 - 5%	Water
Dipotassium Phosphate	7758-11-4	1 - 5%	Dipotassium Phosphate

Notes:
Contains: Aqueous additives, Not Hazardous< 2.0 %. Mixture of high purity Dow PuraGuard™ US Pharmacopeia

grade propylene glycol, phosphate based corrosion inhibitor and pH stabilizer, and confidential performance additives. The actual percentage concentration has been withheld as a trade secret.

4. FIRST-AID MEASURES

Description of first aid measures

General advice
Show this safety data sheet to the doctor in attendance.

Inhalation
Remove to fresh air. (Call a physician if symptoms occur).

Eye contact
Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. Get medical attention if irritation develops and persists.

Skin contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before reuse. Discard contaminated leather articles such as shoes and belt.

Ingestion
Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Call a physician.

Most important symptoms and effects, both acute and delayed:
Corneal injury is unlikely. May cause slight eye irritation Prolonged contact may cause skin irritation with local redness. May cause liver and kidney damage. May cause damage to nasal and respiratory passages. At room temperature, vapors are minimal due to low vapor pressure. If material is heated or mist is produced, concentrations may be attained that are sufficient to cause irritation and other effects. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). May cause nausea or vomiting. May cause abdominal discomfort or diarrhea.

Indication of any immediate medical attention and special treatment needed:

Note to physicians
Treatment based on sound judgment of physician and individual reactions of patient. It is estimated that the oral dose to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenate to various metabolites including glyceraldehydes, glycolic acid and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis and prevention of kidney injury. It is essential to have immediate and follow up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formulation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100 - 150 mg/dl and should be achieved by a rapid loading dose and maintained by intravenous infusion. For severe and /or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentration

greater than 25 mg/dl, or compromise of renal functions.

A more effective intravenous antidote for physician use in 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenases which effectively blocks the formation of toxic metabolites of ethylene glycol. It has been used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis coma, seizures and renal failure have occurred. A generally recommended protocol is a loading dose of 15 mg/kg followed by 10 mg/kg every 12 hours for 4 doses and the 15 mg/kg every 12 hours until the ethylene glycol concentrations are below 20 mg/100ml.Slow intravenous infusion is required. Since 4-methylpyrazole is dialyzable, increased dosage may be necessary during hemodialysis. Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end expiratory pressure may be required. There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia. First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection).

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream, which will spread fire.

Specific hazards arising from the substance or mixture
Use water spray to cool fire-exposed containers and structures. Isolate and restrict area access. Move containers from fire area if you can do it without risk. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Container may rupture from gas generation in a fire situation. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Fight fire from a safe distance and from a protected location. Consider use of unmanned hose holder or monitor nozzles. NEVER use a water jet directly on the fire because it may spread the fire to a larger area.

Hazardous combustion products
Decomposition products can include and are not limited to:. Alcohols. Ethers. Aldehydes. Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

Special protective equipment and precautions for fire-fighters
Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment as required.

Environmental precautions

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Consult local authorities.

Methods and materials for containment and cleaning up

Isolate hazard area and restrict access. Absorb with an inert dry material and place in an appropriate waste disposal

container. Avoid direct contact with material. Small spills: soak up with absorbent material and scoop into containers. Large spills : prevent contamination of waterways. Dike and pump into suitable containers. Clean up residual with absorbent material, place in appropriate container and flush with water.

7. HANDLING AND STORAGE

Precautions for safe handling

For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed. Store in original container. Store in a sealed polyethylene container. Store in accordance with good industrial practices.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits .

Chemical Name	Alberta OEL	British Columbia OEL	Ontario	Quebec OEL	Exposure Limit - ACGIH	Immediately Dangerous to Life or Health - IDLH
Ethylene Glycol 107-21-1	Ceiling: 100 mg/m^3	TWA: 10 mg/m^3 STEL: 20 mg/m^3 Ceiling: 100 mg/m^3 Ceiling: 50 ppm	CEV: 100 mg/m^3	Ceiling: 50 ppm Ceiling: 127 mg/m^3	50 ppm STEL 10 mg/m^3 STEL 25 ppm TLV-TWA	Not available
Water 7732-18-5	Not available	Not available	Not available	Not available	Not available	Not available
Dipotassium Phosphate 7758-11-4	Not available	Not available	Not available	Not available	Not available	Not available

Consult local authorities for recommended exposure limits

Appropriate engineering controls

Engineering controls
In confined areas, local and general ventilation should be provided to maintain airborne concentrations below permissible exposure limits.

Individual protection measures, such as personal protective equipment

Eye/face protection
Safety glasses or goggles. If exposure causes eye discomfort, use a full-face respirator.

Hand protection
When material is heated, wear gloves to protect against thermal burns. Use gloves chemically resistant to this material, examples of preferred glove barrier materials include:. Natural rubber gloves. Neoprene gloves. Nitrile gloves. Polyethylene gloves. Ethyl Vinyl Alcohol Laminate (EVAL). Polyvinylchloride (PVC) gloves. Avoid gloves made

of:. Polyvinyl alcohol (PVA). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials as well as the instructions/specifications provided by the glove supplier.

Skin and body protection
Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance. When handling hot material, protect skin from thermal burns as well as from skin absorption.

Respiratory protection
Respiratory protection is not usually needed unless product is heated or misted. If spraying or misting occurs use a NIOSH approved air purifying respirator.

General hygiene considerations
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state	Liquid
Color	Pink
Odor	Characteristic
Odor threshold	No information available

PROPERTIES	Values	Remarks • Method
pH	9.5 (@ 50%) ASTM D1287	
Melting point / freezing point	-19.4 °C / -2.92 °F	None known
Initial boiling point/boiling range	158 °C / 316 °F	None known
Flash point	127 °C / 261 °F	Pensky-Martens Closed Cup
Evaporation rate	<0.5 Estimated	
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		
Upper flammability limit:	No data available	
Lower flammability limit:	No data available	
Vapor pressure	2.2 mmHg @ 20°C	
Relative vapor density	>1.0	
Specific Gravity	1.1295 @ 20°C	
Water solubility	1000 (RBT)	
Solubility in other solvents	No data available	
Partition coefficient	No data available	
Autoignition temperature	427 °C / 801 °F	
Decomposition temperature	No data available	None known
Kinematic viscosity	14 cSt @ 20°C	
Dynamic viscosity	No data available	None known
Explosive properties	No information available.	
Oxidizing properties	No information available.	
Molecular weight	No information available	
VOC Percentage Volatility	No information available	
Liquid Density	No information available	
Bulk density	No information available	

10. STABILITY AND REACTIVITY

Reactivity/Chemical Stability
Stable

Possibility of hazardous reactions
Not available.

Hazardous polymerization
Will not occur.

Conditions to avoid
Product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials
Strong bases. Strong acids. Oxidizing materials.

Hazardous decomposition products
Hazardous decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to:. Alcohols. Ethers. Aldehydes.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
May cause damage to nasal and respiratory passages. At room temperature, vapors are minimal due to low vapor pressure. If material is heated or mist is produced, concentrations may be attained that are sufficient to cause irritation and other effects.

Eye contact
Corneal injury is unlikely. May cause slight eye irritation. Vapor or mist may cause eye irritation.

Skin contact
Prolonged contact may cause skin irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated contact may cause skin irritation with local redness.

Ingestion
May cause liver and kidney damage. Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). May cause nausea or vomiting. May cause abdominal discomfort or diarrhea.

Information on toxicological effects

Symptoms
Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material. Repeated inhalation of ethylene glycol may produce signs of central nervous system involvement, particularly dizziness and nystagmus (involuntary eye movement). Exposure may place individuals with existing heart problems at added risk of potential cardiac irregularities and heart failure. In animals , effects have been reported on the following organs: Kidney, liver.

Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 521.00 mg/kg
ATEmix (dermal) 11,042.00 mg/kg

Unknown acute toxicity No information available

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethylene Glycol 107-21-1	= 4700 mg/kg (Rat)	= 10600 mg/kg (Rat) = 9530 µL/kg (Rabbit)	Not available
Water 7732-18-5	> 90 mL/kg (Rat)	Not available	Not available
Dipotassium Phosphate 7758-11-4	Not available	Not available	Not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation
Prolonged contact may cause skin irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated contact may cause skin irritation with local redness. Brief contact is essentially non-irritating to skin.

Serious eye damage/eye irritation
Corneal injury is unlikely. May cause slight eye irritation. Vapor or mist may cause eye irritation.

Respiratory or skin sensitization
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
No information available.

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol 107-21-1	Not available	Not available	Not available	Not available
Water 7732-18-5	Not available	Not available	Not available	Not available
Dipotassium Phosphate 7758-11-4	Not available	Not available	Not available	Not available

Reproductive toxicity
Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies. Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. Specifically, growth retardation and decreased litter size in rats and mice and decreased mating frequency in mice were observed.

Specific target organ systemic toxicity - single exposure
Central Nervous System. Kidneys. May cause respiratory irritation.

Specific target organ systemic toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure if swallowed. In animals, effects have been reported on the following organs:. Kidney. Liver.

Aspiration hazard
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

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Chemical Name	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Fish Species Data	Toxicity to microorganisms	Crustacea
Ethylene Glycol 107-21-1	6500 - 13000 mg/L EC50 Pseudokirchneriella subcapitata 96 h	14 - 18 mL/L LC50 (Oncorhynchus mykiss) 96 h static 40000 - 60000 mg/L LC50 (Pimephales promelas) 96 h static 16000 mg/L LC50 (Poecilia reticulata) 96 h static 27540 mg/L LC50 (Lepomis macrochirus) 96 h static 40761 mg/L LC50 (Oncorhynchus mykiss) 96 h static 41000 mg/L LC50 (Oncorhynchus mykiss) 96 h	Not available	EC50: =46300mg/L (48h, Daphnia magna)
Water 7732-18-5	Not available	Not available	Not available	Not available
Dipotassium Phosphate 7758-11-4	Not available	Not available	Not available	Not available

Persistence and degradability No information available.

Bioaccumulation No information available.

Component Information

Chemical Name	Partition coefficient
Ethylene Glycol 107-21-1	-1.93
Water 7732-18-5	Not available
Dipotassium Phosphate 7758-11-4	Not available

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not reuse empty containers.

14. TRANSPORT INFORMATION

TDG (Canada):

UN Number	Not applicable
Shipping name	Not regulated
Class	Not applicable
Packing Group	Not applicable
Marine pollutant	Not available.

DOT (U.S.)

UN Number	UN3082
Shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ETHYLENE GLYCOL)
Class	9
Packing Group	III
Marine pollutant	Not available

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Regulatory Rules

Chemical Name	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Ethylene Glycol - 107-21-1	Not Listed	Listed	Listed
Water - 7732-18-5	Not Listed	Not Listed	Not Listed
Dipotassium Phosphate - 7758-11-4	Not Listed	Not Listed	Not Listed

International Inventories

TSCA	All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.
DSL/NDSL	All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

16. OTHER INFORMATION

NFPA:	**Health hazards** 1	**Flammability** 1	**Instability** 0	**Physical and chemical properties** -
HMIS:	**Health hazards** 2	**Flammability** 1	**Physical hazards** 0	**Personal protection** X

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.

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Revision Date: 18/Sep/2020

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End of Safety Data Sheet