SAFETY DATA SHEET
DOW CHEMICAL (AUSTRALIA) PTY LTD

Product name: NORKOOL™ SLH Concentrate Dyed **Issue Date:** 09.08.2022
Print Date: 10.08.2022

DOW CHEMICAL (AUSTRALIA) PTY LTD encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

SECTION 1: IDENTIFICATION: PRODUCT IDENTIFIER AND CHEMICAL IDENTITY

Product name: NORKOOL™ SLH Concentrate Dyed

Recommended use of the chemical and restrictions on use
Identified uses: Intended as a heat transfer fluid for closed-loop systems. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION
DOW CHEMICAL (AUSTRALIA) PTY LTD
LEVEL 29
367 COLLINS STREET
MELBOURNE VIC 3000
AUSTRALIA

Customer Information Number: 1800-780-074
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1800-033-882
Local Emergency Contact: 1800-033-882
For advice, contact a doctor (at once) or the Australian Poisons Information Centre: 131 126
Transport Emergency Only Dial 000

SECTION 2: HAZARD(S) IDENTIFICATION

GHS Classification
Acute toxicity - Category 4 - Oral
Specific target organ toxicity - repeated exposure - Category 2 - Oral
Short-term (acute) aquatic hazard - Category 3

GHS label elements
Hazard pictograms

Signal word: **WARNING!**

Hazard statements
Harmful if swallowed.
May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.
Harmful to aquatic life.

Precautionary statements

Prevention
Do not breathe mist or vapours.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response
IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
Get medical advice/ attention if you feel unwell.

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

Other hazards
No data available

SECTION 3: COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

This product is a mixture.

Component	CASRN	Concentration
Ethylene glycol	107-21-1	>= 90.0 - <= 95.0 %
Water	7732-18-5	>= 3.0 - <= 5.0 %
Dipotassium hydrogen phosphate	7758-11-4	>= 1.0 - <= 3.0 %

Sodium nitrite	7632-00-0	< 1.0 %
Dipotassium tetraborate	1332-77-0	< 1.0 %
Sodium tolyltriazole	64665-57-2	>= 0.1 - < 0.25 %

SECTION 4: FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air and keep comfortable for breathing; consult a physician.

Skin contact: Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated leather items such as shoes, belts, and watchbands. Suitable emergency safety shower facility should be immediately available.

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. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: Do not induce vomiting. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240 ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (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 1/2 tsp.) (8 ml) liquor for each 10 pounds of body weight, or 2 ml per kg body weight [e.g., 1.2 ounce (2 1/3 tbsp.) for a 40 pound child or 36 ml for an 18 kg child].

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
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 hours; 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 end expiratory pressure may be required. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: FIREFIGHTING MEASURES

Hazchem Code
None Allocated

Extinguishing media

Suitable extinguishing media: Water fog or fine spray.. Dry chemical fire extinguishers.. Carbon dioxide fire extinguishers.. Foam.. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective..

Unsuitable extinguishing media: Do not use direct water stream.. May spread fire..

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.. Combustion products may include and are not limited to:. Nitrogen-containing compounds.. Carbon monoxide.. Carbon dioxide.. Ammonia..

Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.. Liquid mist of this product can burn.. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9..

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry.. Burning liquids may be extinguished by dilution with water.. Do not use direct water stream. May spread fire.. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage..

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves).. If protective equipment is not available or not used, fight fire from a protected location or safe distance..

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Small spills: Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. See Section 13, Disposal Considerations, for additional information.

SECTION 7: HANDLING AND STORAGE, INCLUDING HOW THE CHEMICAL MAY BE SAFELY USED

Precautions for safe handling: Do not swallow. Avoid contact with eyes. Wash thoroughly after handling. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Conditions for safe storage: Do not store in: Galvanized steel. Opened or unlabeled containers. Store in the following material(s): Carbon steel. Stainless steel. Store in original unopened container. See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

Storage stability

Shelf life: Use within
60 Month

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Ethylene glycol	ACGIH	TWA Vapour	25 ppm
	Further information: A4: Not classifiable as a human carcinogen		
	ACGIH	STEL Vapour	50 ppm
	Further information: A4: Not classifiable as a human carcinogen		
	ACGIH	STEL Inhalable fraction, Aerosol only	10 mg/m3
	Further information: A4: Not classifiable as a human carcinogen		
	Dow IHG	TWA	50 mg/m3
	Dow IHG	STEL	100 mg/m3
	AU OEL	TWA particulate	10 mg/m3
	Further information: Sk: Skin absorption		
	AU OEL	TWA Vapour	52 mg/m3 20 ppm

	Further information: Sk: Skin absorption		
	AU OEL	STEL Vapour	104 mg/m3 40 ppm
	Further information: Sk: Skin absorption		
Sodium nitrite	Dow IHG	TWA	5 mg/m3
	Dow IHG	STEL	10 mg/m3
Dipotassium tetraborate	ACGIH	TWA Inhalable particulate matter	2 mg/m3 , Borate
	Further information: A4: Not classifiable as a human carcinogen		
	ACGIH	STEL Inhalable particulate matter	6 mg/m3 , Borate
	Further information: A4: Not classifiable as a human carcinogen		

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Use chemical resistant gloves classified under standard AS/NZS 2161.10: Protective gloves against chemicals and micro-organisms. Use gloves with insulation for thermal protection, when needed. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Examples of preferred glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Avoid gloves made of: Polyvinyl alcohol ("PVA"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 or higher (breakthrough time greater than 480 minutes according to AS/NZS 2161.10) is recommended. When only brief contact is expected , a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to AS/NZS 2161.10) is recommended. 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.

Other protection: When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task. When handling hot material, protect skin from thermal burns as well as from skin absorption.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator.
The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Other Information: Selection and use of personal protective equipment should be in accordance with the recommendations in one or more of the relevant Australian/New Zealand Standards, including:
AS/NZS 1336: Eye and face protection – Guidelines.
AS/NZS 1337: Personal eye protection - Eye and face protectors for occupational applications.
AS/NZS 1715: Selection, use and maintenance of respiratory protective equipment.
AS/NZS 2161: Occupational protective gloves.
AS/NZS 2210: Occupational protective footwear.
AS/NZS 4501: Occupational protective clothing Set

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid.
Color	Green to blue
Odor	Characteristic
Odor Threshold	No test data available
pH	9.5 50% *ASTM D1287* (typical value)
Melting point/freezing point	
Melting point/range	Not applicable to liquids
Freezing point	-19.4 °C *ASTM D1177*
Boiling point, initial boiling point and boiling range	
Boiling point (760 mmHg)	158 °C *Literature*
Flash point	**closed cup** 126.7 °C *Pensky-Martens Closed Cup ASTM D 93* Ethylene glycol
Evaporation Rate (Butyl Acetate = 1)	< 0.5 *Estimated.*
Flammability	
Flammability (solid, gas)	Not applicable to liquids
Flammability (liquids)	Not expected to be a static-accumulating flammable liquid.
Lower explosion limit and upper explosion limit / flammability limit	
Lower explosion limit	3.2 % vol *Literature* Ethylene glycol LFL of major ingredient
Upper explosion limit	No test data available
Vapor Pressure	2.2 mmHg at 20 °C *Literature*
Relative vapour density	
Relative Vapor Density (air = 1)	>1.0 *Literature*
Density and / or relative density	
Relative Density (water = 1)	1.133 at 20 °C / 20 °C *Literature*
Solubility(ies)	
Water solubility	*Literature* completely soluble
Partition coefficient: n-octanol/water (log value)	No data available
Auto-ignition temperature	427 °C *Literature* Ethylene glycol
Decomposition temperature	No test data available

Kinematic Viscosity	14.0 cSt at 20 °C *Literature*
Explosive properties	No data available
Oxidizing properties	No data available
Molecular weight	No data available
Molecular formula	Not applicable (mixture)
Particle characteristics	
Particle size	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible materials: Avoid contact with: Strong acids. Strong oxidizers.

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

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Exposure routes
Ingestion, Inhalation, Skin contact, Eye contact.

Acute toxicity (represents short term exposures with immediate effects - no chronic/delayed effects known unless otherwise noted)

Acute oral toxicity

Information for the Product:

Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Ingestion of quantities (approximately 65 mL (2 oz.) for diethylene glycol or 100 mL (3 oz.) for ethylene glycol) has caused death in humans. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure.
As product: Single dose oral LD50 has not been determined.

Information for components:

Ethylene glycol
In humans, expected to be moderately toxic if swallowed even though oral toxicity was low when tested in animals. Ingestion of quantities (approximately 65 mL (2 oz.) for diethylene glycol or 100 mL (3 oz.) for ethylene glycol) has caused death in humans. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure.

Lethal Dose, Human, adult, 100 ml Estimated.

Dipotassium hydrogen phosphate
LD50, Rat, female, > 2,000 mg/kg No deaths occurred at this concentration.

Sodium nitrite
May cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. LD50, Rat, 180 mg/kg

Dipotassium tetraborate
For this family of materials: LD50, Rat, male, 3,690 mg/kg

Sodium tolyltriazole
LD50, Rat, male, 930 mg/kg OECD 401 or equivalent

LD50, Rat, female, 735 mg/kg OECD 401 or equivalent

Acute dermal toxicity

Information for the Product:

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

For similar material(s):
LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

Information for components:

Ethylene glycol
LD50, Rabbit, > 10,600 mg/kg

LD50, Mouse, male and female, > 3,500 mg/kg

Dipotassium hydrogen phosphate
LD50, Rabbit, > 5,000 mg/kg

Sodium nitrite
The dermal LD50 has not been determined.

Dipotassium tetraborate
For this family of materials: LD50, Rat, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Sodium tolyltriazole
LD50, Rabbit, male and female, > 2,000 mg/kg OECD 402 or equivalent No deaths occurred at this concentration.

Acute inhalation toxicity

Information for the Product:

At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea.

For Ethylene glycol:
LC50, Rat, male and female, 6 Hour, Aerosol, > 2.5 mg/l
Information for components:

Ethylene glycol
LC50, Rat, male and female, 6 Hour, dust/mist, > 2.5 mg/l

Dipotassium hydrogen phosphate
For similar material(s): Maximum attainable concentration. LC50, Rat, male and female, 4 Hour, dust/mist, > 0.83 mg/l No deaths occurred at this concentration.

Sodium nitrite
The LC50 has not been determined.

Dipotassium tetraborate
For this family of materials: LC50, Rat, male and female, 4 Hour, dust/mist, > 2.03 mg/l OECD Test Guideline 403 No deaths occurred at this concentration.

Sodium tolyltriazole
The LC50 has not been determined.

Skin corrosion/irritation

Information for the Product:

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.

Information for components:

Ethylene glycol
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.

Dipotassium hydrogen phosphate
Prolonged contact may cause slight skin irritation with local redness.

Sodium nitrite
Brief contact is essentially nonirritating to skin.
Prolonged contact may cause skin irritation with local redness.

Dipotassium tetraborate
Brief contact is essentially nonirritating to skin.

Sodium tolyltriazole
Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.

Serious eye damage/eye irritation

Information for the Product:

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

Information for components:

Ethylene glycol
May cause slight eye irritation.
Corneal injury is unlikely.
Vapor or mist may cause eye irritation.

Dipotassium hydrogen phosphate
May cause slight eye irritation.
May cause slight temporary corneal injury.
Dust may irritate eyes.
Mist may cause eye irritation.

Sodium nitrite
May cause moderate eye irritation.
May cause slight temporary corneal injury.

Dipotassium tetraborate
May cause slight eye irritation.
Corneal injury is unlikely.

Sodium tolyltriazole
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Sensitization

Information for the Product:

For the major component(s):
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Information for components:

Ethylene glycol
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Dipotassium hydrogen phosphate
For similar material(s):
Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Sodium nitrite
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Dipotassium tetraborate
For this family of materials, sensitization studies done in guinea pigs have been negative.

For respiratory sensitization:
No relevant data found.

Sodium tolyltriazole
For skin sensitization:
For similar material(s):
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Information for the Product:

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Information for components:

Ethylene glycol
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Dipotassium hydrogen phosphate
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Sodium nitrite

Available data are inadequate to determine single exposure specific target organ toxicity.

Dipotassium tetraborate
Available data are inadequate to determine single exposure specific target organ toxicity.

Sodium tolyltriazole
Material is corrosive. Material is not classified as a respiratory irritant; however, upper respiratory tract irritation or corrosivity may be expected.

Aspiration Hazard

Information for the Product:

Based on available information, aspiration hazard could not be determined.

Information for components:

Ethylene glycol
Based on physical properties, not likely to be an aspiration hazard.

Dipotassium hydrogen phosphate
Based on physical properties, not likely to be an aspiration hazard.

Sodium nitrite
Based on physical properties, not likely to be an aspiration hazard.

Dipotassium tetraborate
Based on physical properties, not likely to be an aspiration hazard.

Sodium tolyltriazole
Aspiration into the respiratory system may occur during ingestion or vomiting. Due to corrosivity, tissue damage or lung injury may occur.

Chronic toxicity (represents longer term exposures with repeated dose resulting in chronic/delayed effects - no immediate effects known unless otherwise noted)

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Information for the Product:

For the major component(s):
Observations in humans include:
Nystagmus (involuntary eye movement).
In animals, effects have been reported on the following organs:
Kidney.
Liver.

Information for components:

Ethylene glycol
Observations in humans include:
Nystagmus (involuntary eye movement).
In animals, effects have been reported on the following organs:
Kidney.

Liver.

Dipotassium hydrogen phosphate
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Sodium nitrite
May cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen.
In humans, symptoms may include:
May cause central nervous system depression.
May cause dizziness and drowsiness.
Headache.
Incoordination.
In animals, effects have been reported on the following organs:
Heart.
Liver.
Spleen.
Gastrointestinal tract.
Testes.
Observations in animals include:
Low blood pressure.

Dipotassium tetraborate
For this family of materials:
In humans, symptoms may include:
Respiratory effects.
In animals, effects have been reported on the following organs:
Blood
Testes.

Sodium tolyltriazole
For similar material(s):
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Carcinogenicity

Information for the Product:

Ethylene glycol did not cause cancer in long-term animal studies.

Information for components:

Ethylene glycol
Ethylene glycol did not cause cancer in long-term animal studies.

Dipotassium hydrogen phosphate
No relevant data found.

Sodium nitrite
Sodium nitrite has produced tumors in laboratory animals only at high doses; low dietary doses did not cause cancer in laboratory animals. It has caused tumors in animals when given in combination with secondary amines or disulfiram (for treatment of alcoholism).

Persons on disulfiram (ANTABUSE) therapy with possible exposure to nitrites should seek medical advice.

Dipotassium tetraborate
For this family of materials: Did not cause cancer in laboratory animals.

Sodium tolyltriazole
No relevant data found.

Teratogenicity

Information for the Product:

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. In laboratory animals, boron compounds have caused birth defects only at doses toxic to the mother and have been toxic to the fetus at doses nontoxic to the mother.

Information for components:

Ethylene glycol
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.

Dipotassium hydrogen phosphate
For similar material(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Sodium nitrite
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Dipotassium tetraborate
In laboratory animals, boron compounds have caused birth defects only at doses toxic to the mother and have been toxic to the fetus at doses nontoxic to the mother.

Sodium tolyltriazole
For this family of materials: Has caused birth defects in laboratory animals.

Reproductive toxicity

Information for the Product:

Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. In animal studies, boron compounds have been shown to interfere with fertility in males, and to a lesser degree in females.

Information for components:

Ethylene glycol

Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.

Dipotassium hydrogen phosphate
For similar material(s): In animal studies, did not interfere with reproduction.

Sodium nitrite
No relevant data found.

Dipotassium tetraborate
In animal studies, boron compounds have been shown to interfere with fertility in males, and to a lesser degree in females.

Sodium tolyltriazole
For similar material(s): In animal studies, did not interfere with reproduction.

Mutagenicity

Information for the Product:

For the major component(s): Ethylene glycol. In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Information for components:

Ethylene glycol
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Dipotassium hydrogen phosphate
In vitro genetic toxicity studies were negative.

Sodium nitrite
In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

Dipotassium tetraborate
For this family of materials: In vitro mutagenicity studies were negative. Animal genetic toxicity studies were negative.

Sodium tolyltriazole
For similar material(s): In vitro genetic toxicity studies were negative.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Ecotoxicity

Ethylene glycol

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 72,860 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapita, 96 Hour, Growth rate inhibition, 6,500 - 13,000 mg/l

Toxicity to bacteria
EC50, activated sludge, 30 min, 225 mg/l, OECD 209 Test

Chronic toxicity to fish
NOEC, Pimephales promelas (fathead minnow), 7 d, 15,380 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Ceriodaphnia dubia (water flea), 7 d, 8,590 mg/l

Dipotassium hydrogen phosphate

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 48 Hour, > 900 mg/l, Method Not Specified.

Sodium nitrite

Acute toxicity to fish
Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 Hour, 0.54 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 24 Hour, 130 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate, > 100 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, 48 Hour, 281 mg/l

Chronic toxicity to fish
NOEC, Cyprinus carpio (Carp), 30 d, 21 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Penaeid Shrimp, 80 d, 9.86 mg/l

Dipotassium tetraborate

Acute toxicity to fish
For this family of materials:
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
For this family of materials:

LC50, dab (Limanda limanda), flow-through, 96 Hour, 523 mg/l

Acute toxicity to aquatic invertebrates
For this family of materials:
LC50, Daphnia magna (Water flea), static test, 48 Hour, 939 mg/l, OECD Test Guideline 202 or Equivalent

Sodium tolyltriazole

Acute toxicity to fish
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).
For similar material(s):
LC50, Zebra fish (Danio/Brachydanio rerio), semi-static test, 96 Hour, > 173 mg/l, OECD Test Guideline 203 or Equivalent
For similar material(s):
LC50, Sheepshead minnow (Cyprinodon variegatus), semi-static test, 98 Hour, 55 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
For similar material(s):
EC50, Daphnia galeata (water flea), static test, 48 Hour, 8.58 mg/l, OECD Test Guideline 202 or Equivalent
For similar material(s):
LC50, Marine copepod (acartia tonsa), Static, 48 Hour, 55 mg/l

Acute toxicity to algae/aquatic plants
For similar material(s):
NOEC, Skeletonema costatum (marine diatom), Static, 72 Hour, Growth rate, 1.18 mg/l
For similar material(s):
ErC50, Skeletonema costatum (marine diatom), Static, 72 Hour, Growth rate, 53 mg/l
For similar material(s):
ErC50, Pseudokirchneriella subcapitata (green algae), Static, 72 Hour, Growth rate, 75 mg/l, OECD Test Guideline 201 or Equivalent
For similar material(s):
NOEC, Pseudokirchneriella subcapitata (green algae), Static, 72 Hour, Growth rate, 10 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
For similar material(s):
EC50, Bacteria (active sludge), Static, 1 d, Respiration rates., 1,060 mg/l

Chronic toxicity to aquatic invertebrates
For similar material(s):
EC10, Daphnia galeata (water flea), semi-static test, 21 d, number of offspring, 0.4 mg/l
For similar material(s):
NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 18.4 mg/l

Persistence and degradability

Ethylene glycol

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material has inherent, ultimate biodegradability according to OECD test (s) guidelines (reaches > 60 or 70% biodegradation in OECD test(s).
10-day Window: Pass

Biodegradation: 90 - 100 %
Exposure time: 10 d
Method: OECD Test Guideline 301A or Equivalent
10-day Window: Not applicable
Biodegradation: 90 %
Exposure time: 1 d
Method: OECD Test Guideline 302B or Equivalent

Theoretical Oxygen Demand: 1.29 mg/mg

Dipotassium hydrogen phosphate
Biodegradability: Biodegradability is not applicable to inorganic substances.

Sodium nitrite
Biodegradability: Biodegradation is not applicable.

Theoretical Oxygen Demand: 0.23 mg/mg

Dipotassium tetraborate
Biodegradability: Biodegradation is not applicable.

Sodium tolyltriazole
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
For similar material(s):
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Bioaccumulative potential

Ethylene glycol
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -1.36 Measured
Bioconcentration factor (BCF): 10 Leuciscus idus (Golden orfe)

Dipotassium hydrogen phosphate
Bioaccumulation: No bioconcentration is expected because of the relatively high water solubility.

Sodium nitrite
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -3.7 Measured

Dipotassium tetraborate
Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Sodium tolyltriazole
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 1.087 at 25 °C OECD Test Guideline 117 or Equivalent

Mobility in Soil

Ethylene glycol

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): 1 Estimated.

Dipotassium hydrogen phosphate

No relevant data found.

Sodium nitrite

No relevant data found.

Dipotassium tetraborate

No relevant data found.

Sodium tolyltriazole

Partition coefficient (Koc): 100 Estimated.

Results of PBT and vPvB assessment

Ethylene glycol

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Dipotassium hydrogen phosphate

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Sodium nitrite

PBT assessment does not apply

Dipotassium tetraborate

PBT assessment does not apply

Sodium tolyltriazole

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Other adverse effects

Ethylene glycol

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Dipotassium hydrogen phosphate

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Sodium nitrite

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Dipotassium tetraborate

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Sodium tolyltriazole

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

SECTION 14: TRANSPORT INFORMATION

ADG

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

Hazchem Code
None Allocated

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: REGULATORY INFORMATION

Poison Schedule
S5

Product repackaged for public consumer use should be labelled in accordance with the current Standard for the Uniform Scheduling of Medicines and Poisons.

Australian Inventory of Industrial Chemicals (AIIC)
All substances contained in this product are listed on the Australian Inventory of Industrial Chemicals, or are not required to be listed.

Prohibition/Licensing Requirements : Refer to model WHS Act and Regulations for prohibition, authorisation and restricted use.

SECTION 16: ANY OTHER RELEVANT INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
1	1	0

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.
Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
AU OEL	Australia. Workplace Exposure Standards for Airborne Contaminants.
Dow IHG	Dow Industrial Hygiene Guideline
STEL	Short term exposure limit
TWA	Time weighted average

Full text of other abbreviations
AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization;

IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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