SAFETY DATA SHEET
Motaquip Engine Coolant Hybrid OAT Formulation

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name Motaquip Engine Coolant Hybrid OAT Formulation

Product number VCA135, VCA131

Internal identification B16921, 16551, 16550

Container size 5 Litre bottles, 1 Litre

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Antifreeze liquid.

Uses advised against This product is not recommended for any industrial, professional or consumer use other than the identified uses stated above.

1.3. Details of the supplier of the safety data sheet

Supplier

MOTAQUIP LIMITED
Eliot Park Innovation Centre
4 Barling Way
Nuneaton
Warwickshire
CV10 7RH
United Kingdom
02477 714777

1.4. Emergency telephone number

Emergency telephone Tel: 02477 714777

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not Classified

Health hazards Acute Tox. 4 - H302 STOT RE 2 - H373

Environmental hazards Not Classified

2.2. Label elements

Pictogram

Signal word Warning

Hazard statements H302 Harmful if swallowed.
H373 May cause damage to organs through prolonged or repeated exposure.

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Precautionary statements

P260 Do not breathe vapour/ spray.
P264 Wash contaminated skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P314 Get medical advice/ attention if you feel unwell.
P330 Rinse mouth.
P501 Dispose of contents/ container in accordance with national regulations.
P102 Keep out of reach of children.

Contains ETHANEDIOL, SODIUM NITRITE

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

ETHANEDIOL **60-100%**

CAS number: 107-21-1 EC number: 203-473-3 REACH registration number: 01-2119456816-28-XXXX

Classification
Acute Tox. 4 - H302
STOT RE 2 - H373

SODIUM BENZOATE **1-5%**

CAS number: 532-32-1 EC number: 208-534-8 REACH registration number: 01-2119460683-35-XXXX

Classification
Eye Irrit. 2 - H319

DISODIUM TETRABORATE PENTAHYDRATE **1-5%**

CAS number: 12179-04-3 EC number: 215-540-4 REACH registration number: 01-2119490790-32-XXXX

Substance included in the Candidate List of Substances of Very High Concern according to article 59 (1,10) of regulation EC No. 1907/2006 ('REACH').

Classification
Eye Irrit. 2 - H319
Repr. 1B - H360FD

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SODIUM NITRITE **<1%**

CAS number: 7632-00-0 EC number: 231-555-9 REACH registration number: 01-2119471836-27-XXXX

M factor (Acute) = 1

Classification
Ox. Sol. 3 - H272
Acute Tox. 3 - H301
Eye Irrit. 2 - H319
Aquatic Acute 1 - H400

SODIUM NITRATE **<1%**

CAS number: 7631-99-4 EC number: 231-554-3 REACH registration number: 01-2119488221-41-XXXX

Classification
Eye Irrit. 2 - H319

TOLYLTRIAZOLE **<1%**

CAS number: 29385-43-1 EC number: 249-596-6 REACH registration number: 01-2119979081-35-XXXX

Classification
Acute Tox. 4 - H302
Eye Irrit. 2 - H319
Aquatic Chronic 2 - H411

DISODIUM MONOMOLYBDATE DIHYDRATE **<1%**

CAS number: 10102-40-6 EC number: 231-551-7 REACH registration number: 05-2116507364-51-XXXX

Classification
Not Classified

SODIUM HYDROXIDE **<1%**

CAS number: 1310-73-2 EC number: 215-185-5 REACH registration number: 01-2119457892-27-XXXX

Classification
Met. Corr. 1 - H290
Skin Corr. 1A - H314
Eye Dam. 1 - H318

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SODIUM METHYL METHYLPHOSPHONATE	**<1%**
CAS number: 73750-69-3	

Classification
Skin Irrit. 2 - H315
Eye Irrit. 2 - H319
STOT SE 3 - H335

METHANOL		**<1%**
CAS number: 67-56-1	EC number: 200-659-6	REACH registration number: 01-2119433307-44-XXXX

Classification
Flam. Liq. 2 - H225
Acute Tox. 3 - H301
Acute Tox. 3 - H311
Acute Tox. 3 - H331
STOT SE 1 - H370

BIS(TRIHYDROXYSILYLPROPYL)METHYLPHOSPHONATE, SODIUM SALT	**<1%**
CAS number: —	

Classification
Skin Irrit. 2 - H315
Eye Irrit. 2 - H319
STOT SE 3 - H335

DENATONIUM BENZOATE		**<1%**
CAS number: 3734-33-6	EC number: 223-095-2	

Classification
Acute Tox. 4 - H302
Acute Tox. 4 - H332
Aquatic Chronic 3 - H412

The full text for all hazard statements is displayed in Section 16.

Composition comments The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information 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 affected person to fresh air at once. Get medical attention. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen.

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Ingestion Do not induce vomiting. Remove affected person from source of contamination. Get 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].

Skin contact Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing. Wash contaminated clothing before reuse. Destroy contaminated leather items such as shoes, belts, and watchbands.

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.

4.2. Most important symptoms and effects, both acute and delayed

General information Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Check section 3.2 to obtain percentage of ethylene glycol in this product, the following is based on 100% ethylene glycol content. 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

5.1. Extinguishing media

Suitable extinguishing media The product is not flammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

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Specific hazards Combustible Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

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: Carbon monoxide. Carbon dioxide. Nitrogen oxides.

5.3. Advice for firefighters

Protective actions during firefighting Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Fight advanced or massive fires from safe distance or protected location. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Do not use water jet as an extinguisher, as this will spread the fire. If a leak or spill has not ignited, use water spray to disperse vapours and protect men stopping the leak. Extinguishing waters may present a risk of damage to the environmental, collect and dispose of as hazardous waste, in accordance with local legislation.

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

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions 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. No smoking, sparks, flames or other sources of ignition near spillage. Avoid inhalation of vapours and contact with skin and eyes.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Contain spilled material if possible. Containers with collected spillage must be properly labelled with correct contents and hazard symbol. Small Spillages: Absorb with materials such as: Cat litter. Sand. Sawdust. Zorb-all®. Hazorb®. Large spills: Dike area to contain spill. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. See Section 11 for additional information on health hazards. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid spilling. Do not swallow. Do not handle broken packages without protective equipment. Good personal hygiene procedures should be implemented. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Avoid contact with skin and eyes.

7.2. Conditions for safe storage, including any incompatibilities

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Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep away from food, drink and animal feeding stuffs. Keep only in the original container.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

ETHANEDIOL

Long-term exposure limit (8-hour TWA): WEL 52 mg/m³ 20 ppm
Short-term exposure limit (15-minute): WEL 104 mg/m3 40 ppm vapour
Sk
Long-term exposure limit (8-hour TWA): WEL 10 mg/m³ particulate

SODIUM BENZOATE

No exposure limit value known.

DISODIUM TETRABORATE PENTAHYDRATE

Long-term exposure limit (8-hour TWA): 1 mg/m³

SODIUM NITRATE

No exposure limit value known.

TOLYLTRIAZOLE

No exposure limit value known.

DISODIUM MONOMOLYBDATE DIHYDRATE

Long-term exposure limit (8-hour TWA): WEL 5 mg/m³, as Mo. inhalable dust
Short-term exposure limit (15-minute): WEL 10 mg/m³ inhalable dust
as Mo

SODIUM HYDROXIDE

Short-term exposure limit (15-minute): WEL 2 mg/m³

SODIUM METHYL METHYLPHOSPHONATE

No exposure limit value known.

METHANOL

Long-term exposure limit (8-hour TWA): WEL 200 ppm 266 mg/m³
Short-term exposure limit (15-minute): WEL 250 ppm 333 mg/m³
Long-term exposure limit (8-hour TWA): 2006/15/EC 200 ppm 260 mg/m³
Sk

BIS(TRIHYDROXYSILYLPROPYL)METHYLPHOSPHONATE, SODIUM SALT

No exposure limit value known.

DENATONIUM BENZOATE

No exposure limit value known.

WEL = Workplace Exposure Limit
Sk = Can be absorbed through skin.
Sk = Can be absorbed through the skin.

Ingredient comments WEL = Workplace Exposure Limits

ETHANEDIOL (CAS: 107-21-1)

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DNEL

Industry - Dermal; Long term systemic effects: 106 mg/kg bw/day
Industry - Inhalation; Long term local effects: 35 mg/m³
Consumer - Dermal; Long term systemic effects: 53 mg/kg bw/day
Consumer - Inhalation; Long term local effects: 7 mg/m³

PNEC

- Fresh water; 10 mg/l
- Marine water; 1 mg/l
- Sediment (Freshwater); 37 mg/kg sediment dw
- Intermittent release; 10 mg/l
- Soil; 1.53 mg/kg
- STP; 199.5 mg/l
- Sediment (Marinewater); 3.7 mg/kg sediment dw
- Soil; 1.53 mg/kg soil dw

SODIUM BENZOATE (CAS: 532-32-1)

DNEL

Workers - Inhalation; Long term systemic effects: 3 mg/m³
Workers - Dermal; Long term systemic effects: 62.5 mg/kg bw/day
Workers - Inhalation; Long term local effects: 0.1 mg/m³
General population - Inhalation; Long term systemic effects: 1.5 mg/m³
General population - Inhalation; Long term local effects: 0.06 mg/m³
General population - Dermal; Long term systemic effects: 31.25 mg/kg bw/day
General population - Oral; Long term systemic effects: 16.6 mg/kg bw/day

PNEC

- Fresh water; 0.13 mg/l
- Marine water; 0.013 mg/l
- Intermittent release; 0.305 mg/l
- STP; 10 mg/l
- Sediment (Freshwater); 1.76 mg/kg sediment dw
- Sediment (Marinewater); 0.176 mg/kg sediment dw
- Soil; 0.000265 mg/kg soil dw

DISODIUM TETRABORATE PENTAHYDRATE (CAS: 12179-04-3)

DNEL

Workers - Inhalation; Long term, Short term local effects, Acute: 11.7 mg/m³
Workers - Inhalation; Long term systemic effects: 6.7 mg/m³
General population - Oral; Long term, Short term systemic effects, Acute: 0.79 mg/kg bw/day
General population - Inhalation; Long term, Short term local effects, Acute: 11.7 mg/m³
General population - Dermal; Long term systemic effects: 159.5 mg/kg bw/day
Workers - Dermal; Long term systemic effects: 316.4 mg/kg bw/day
General population - Inhalation; Long term systemic effects: 3.4 mg/m³

PNEC

- Fresh water; 2.9 mg/l
- Marine water; 2.9 mg/l
- Intermittent release; 13.7 mg/l
- STP; 10 mg/l
- Soil; 5.7 mg/kg soil dw

SODIUM NITRITE (CAS: 7632-00-0)

DNEL

Industry - Inhalation; Long term, Short term systemic effects, Acute: 2 mg/m³

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PNEC

- Fresh water; 0.0054 mg/l
- Intermittent release; 0.0054 mg/l
- Marine water; 0.00616 mg/l
- Sediment (Freshwater); 0.0195 mg/kg sediment dw
- Sediment (Marinewater); 0.0223 mg/kg sediment dw
- Soil; 0.000733 mg/kg soil dw
- STP; 21 mg/l

SODIUM NITRATE (CAS: 7631-99-4)

DNEL

Workers - Inhalation; Long term systemic effects: 36.7 mg/m³
Workers - Dermal; Long term systemic effects: 20.8 mg/kg bw/day
General population - Inhalation; Long term systemic effects: 10.9 mg/m³
General population - Oral, Dermal; Long term systemic effects: 12.5 mg/kg bw/day

PNEC

- Fresh water; 0.45 mg/l
- Marine water; 0.045 mg/l
- Intermittent release; 4.5 mg/l
- STP; 18 mg/l

SODIUM SILICATE SOLUTION (CAS: 1344-09-8)

DNEL

Industry - Inhalation; Long term systemic effects: 5.61 mg/m³
Industry - Dermal; Long term systemic effects: 1.59 mg/kg bw/day
Consumer - Oral; Long term systemic effects: 0.80 mg/kg bw/day
Consumer - Inhalation; Long term systemic effects: 1.38 mg/m³
Consumer - Dermal; Long term systemic effects: 0.80 mg/kg bw/day

PNEC

- Fresh water; 7.5 mg/l
- Marine water; 1 mg/l
- Intermittent release; 7.5 mg/l
- STP; 348 mg/l

TOLYLTRIAZOLE (CAS: 29385-43-1)

DNEL

Workers - Inhalation; Long term systemic effects: 8.8 mg/m³
Workers - Dermal; Long term systemic effects: 0.5 mg/kg bw/day
General population - Inhalation; Long term systemic effects: 4.4 mg/m³
General population - Dermal; Long term, Short term systemic effects, Acute: 0.25 mg/kg bw/day

PNEC

- Fresh water; 0.008 mg/l
- Marine water; 0.008 mg/l
- Intermittent release; 0.086 mg/l
- STP; 39.4 mg/l
- Sediment (Freshwater); 0.0025 mg/kg sediment dw
- Sediment (Marinewater); 0.0025 mg/kg sediment dw
- Soil; 0.0024 mg/kg soil dw

DISODIUM MONOMOLYBDATE DIHYDRATE (CAS: 10102-40-6)

DNEL

Workers - Inhalation; Long term systemic effects: 28 mg/m³

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PNEC

- Fresh water; 32.0 mg/l
- Marine water; 4.8 mg/l
- Sediment (Freshwater); 57000 mg/kg sediment dw
- Sediment (Marinewater); 4995 mg/kg sediment dw
- Soil; from 29.8 to 474 mg/kg soil dw
- STP; 54.7 mg/l

SODIUM HYDROXIDE (CAS: 1310-73-2)

DNEL

Consumer - Inhalation; local effects: 1 mg/m³
Industry - Inhalation; Long term local effects: 1 mg/m³

SODIUM METHYL METHYLPHOSPHONATE (CAS: 73750-69-3)

DNEL

No DNEL available.

PNEC

No PNEC available.

METHANOL (CAS: 67-56-1)

DNEL

Industry - Dermal; Short term Acute: 40 mg/kg bw/day
Industry - Dermal; Long term systemic effects: 40 mg/kg bw/day
Industry - Inhalation; Short term Acute: 260 mg/m³
Industry - Inhalation; Long term systemic effects: 260 mg/m³
Consumer - Dermal; Short term Acute: 8 mg/kg bw/day
Consumer - Dermal; Long term systemic effects: 8 mg/kg bw/day
Consumer - Inhalation; Long term systemic effects: 50 mg/m³
Industry - Inhalation; Short term Acute: 260 mg/m³
Industry - Inhalation; Long term local effects: 260 mg/m³
Consumer - Inhalation; Short term Acute: 50 mg/m³
Consumer - Inhalation; Long term local effects: 50 mg/m³

PNEC

- Fresh water; 20.8 mg/l
- Marine water; 2.08 mg/l
- Soil; 3.18 mg/kg soil dw
- STP; 100 mg/l
- Sediment (Freshwater); 77 mg/kg sediment dw
- Intermittent release; 1540 mg/l
- Sediment (Marinewater); 7.7 mg/kg sediment dw

BIS(TRIHYDROXYSILYLPROPYL)METHYLPHOSPHONATE, SODIUM SALT

DNEL

No DNEL available.

PNEC

No PNEC available.

DENATONIUM BENZOATE (CAS: 3734-33-6)

DNEL

Workers - Inhalation; Long term systemic effects: 15.748 mg/m³
Workers - Dermal; Long term systemic effects: 8.932 mg/kg bw/day
General population - Inhalation; Long term systemic effects: 3.883 mg/m³
General population - Dermal; Long term systemic effects: 4.466 mg/kg bw/day
General population - Oral; Long term systemic effects: 2.233 mg/kg bw/day

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PNEC

- Fresh water; 0.1 mg/l
- Marine water; 0.01 mg/l
- Intermittent release; 1 mg/l
- STP; 51.158 mg/l
- Sediment (Freshwater); 33.692 mg/kg sediment dw
- Sediment (Marinewater); 3.369 mg/kg sediment dw
- Soil; 16.127 mg/kg soil dw

BENZYL VIOLET 4B (CAS: 1694-09-3)

DNEL No DNEL available.

PNEC No PNEC available.

8.2. Exposure controls

Protective equipment

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients.

Eye/face protection Use safety glasses (with side shields), consistent with EN 166 or equivalent. If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles (goggles consistent with EN 166 or equivalent). If exposure causes eye discomfort, use a full-face respirator.

Hand protection Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Use gloves with insulation for thermal protection (EN 407), when needed. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) 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 EN 374) 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 skin and body protection Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact. Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, 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.

Hygiene measures Do not smoke in work area. Wash at the end of each work shift and before eating, smoking and using the toilet. Promptly remove any clothing that becomes contaminated. Wash promptly with soap and water if skin becomes contaminated. Use appropriate skin cream to prevent drying of skin. Do not eat, drink or smoke when using this product.

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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 discomfort is experienced, use an approved air-purifying respirator. Use CE approved air-purifying respirator with combination filter type A1P2 minimum.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Clear liquid.
Colour	Green.
Odour	Almost odourless.
pH	pH (diluted solution): 7.7-8.2 @ 50% SOLUTION
Initial boiling point and range	>150°C @ 760 mm Hg
Flash point	117°C CC (Closed cup).
Relative density	1.12-1.15 @ 20°C
Solubility(ies)	Completely soluble in water.

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Stable at normal ambient temperatures and when used as recommended.

10.2. Chemical stability

Stability	Stable at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Will not polymerise.

10.4. Conditions to avoid

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

10.5. Incompatible materials

Materials to avoid	Strong acids. Strong oxidising agents. Strong alkalis.

10.6. Hazardous decomposition products

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: Aldehydes. Ethers. Alcohols.

SECTION 11: Toxicological information

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11.1. Information on toxicological effects

Toxicological effects The product is not expected to be toxic to aquatic organisms.

Other health effects There is no evidence that the product can cause cancer.

Acute toxicity - oral

Notes (oral LD_{50}) Harmful if swallowed.

ATE oral (mg/kg) 543.05

Specific target organ toxicity - repeated exposure

STOT - repeated exposure May cause damage to organs through prolonged or repeated exposure.

General information To the best of our knowledge the chemical, physical and toxicological properties have not been thoroughly investigated.

Inhalation Unlikely to be hazardous by inhalation because of the low vapour pressure of the product at ambient temperature. Vapour may irritate respiratory system/lungs.

Ingestion Harmful: possible risk of irreversible effects if swallowed. Headache. Nausea, vomiting. There may be soreness and redness of the mouth and throat.

Skin contact Prolonged and frequent contact may cause redness and irritation. Not a skin sensitiser.

Eye contact May cause eye irritation.

Acute and chronic health hazards May cause damage to kidneys and liver through prolonged or repeated exposure (oral).

Route of entry Ingestion.

Medical symptoms Headache. Nausea, vomiting.

Toxicological information on ingredients.

ETHANEDIOL

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg) 7,712.0

Species Rat

Notes (oral LD_{50}) Acute oral toxicity is expected to be moderate in humans eventhough animals test results would suggest a low toxicity. Ingestion of approximately 100ml has caused death in humans. Ingestion may cause nausea, vomiting, abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects and kidney failure.

ATE oral (mg/kg) 500.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg) 3,501.0

Species Mouse

ATE dermal (mg/kg) 3,501.0

Acute toxicity - inhalation

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Acute toxicity inhalation (LC_{50} vapours mg/l)	2.6
Species	Rat
Notes (inhalation LC_{50})	At room temperature exposure to vapour is minimal due to low volatility. With good ventilation single exposure is not expected to cause adverse effect. If the product is heated or the working area has poor ventilation, vapour/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea.

Skin corrosion/irritation

Animal data	Not irritating. Rabbit

Serious eye damage/irritation

Serious eye damage/irritation	Not irritating. Rabbit

Respiratory sensitisation

Respiratory sensitisation	Guinea pig: Not sensitising.

Skin sensitisation

Skin sensitisation	- Guinea pig: Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro	Negative.
Genotoxicity - in vivo	Negative.

Carcinogenicity

Carcinogenicity	The current toxicological kowledge allows to not classify the product as a carcinogen.

Reproductive toxicity

Reproductive toxicity - fertility	Ingestion of large amounts has been shown to interfere with reproduction in animals.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure	Observations in humans include: Nystagmus (involuntary eye movement). In animals effects have been reported on the following organs: kidneys and liver. NOAEL 150 mg/kg/day, Oral, Rat
Target organs	Kidneys

Inhalation	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.
Ingestion	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. For Ethylene glycol: Lethal Dose, Human, adult 100 ml LD50, rat, male and female 7,712 mg/kg.

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Skin contact	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.
Eye contact	May cause temporary eye irritation.
Route of entry	Ingestion.
Target organs	Kidneys Liver

DISODIUM TETRABORATE PENTAHYDRATE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	3,305.0
Species	Rat
Notes (oral LD_{50})	Low acute oral toxicity.
ATE oral (mg/kg)	3,305.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	2,001.0
Species	Rabbit
Notes (dermal LD_{50})	The substance is poorly absorbed through intact skin. Low acute dermal toxicity.
ATE dermal (mg/kg)	2,001.0

Acute toxicity - inhalation

Notes (inhalation LC_{50})	Low acute inhalation toxicity.

Skin corrosion/irritation

Animal data	Not irritating.

Serious eye damage/irritation

Serious eye damage/irritation	Moderately irritating.

Respiratory sensitisation

Respiratory sensitisation	Data lacking.

Skin sensitisation

Skin sensitisation	Not sensitising.

Carcinogenicity

Carcinogenicity	No evidence of carcinogenicity in animal studies.

Reproductive toxicity

Reproductive toxicity - fertility	Known reproductive toxicant based on animal evidence.
Reproductive toxicity - development	Known reproductive toxicant based on animal evidence.

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Specific target organ toxicity - single exposure

STOT - single exposure	Conclusive data but not sufficient for classification.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure	Conclusive data but not sufficient for classification.

Aspiration hazard

Aspiration hazard	Conclusive data but not sufficient for classification.

Skin contact	Not irritating. Not a skin sensitiser.
Eye contact	Mild eye irritant in rabbits.

SODIUM NITRITE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	180.0
Species	Rat
ATE oral (mg/kg)	180.0

Acute toxicity - dermal

Notes (dermal LD_{50})	Scientifically unjustified.

Acute toxicity - inhalation

Notes (inhalation LC_{50})	Scientifically unjustified.

Skin corrosion/irritation

Animal data	Not irritating.

Serious eye damage/irritation

Serious eye damage/irritation	Irritating to eyes.

Respiratory sensitisation

Respiratory sensitisation	Data lacking.

Skin sensitisation

Skin sensitisation	Not irritating. Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro	Conclusive data but not sufficient for classification.
Genotoxicity - in vivo	Conclusive data but not sufficient for classification.

Carcinogenicity

Carcinogenicity	Conclusive data but not sufficient for classification.
IARC carcinogenicity	IARC Group 2A Probably carcinogenic to humans.

Reproductive toxicity

Reproductive toxicity - fertility	Conclusive data but not sufficient for classification.

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Specific target organ toxicity - single exposure

STOT - single exposure	There is a risk of damage to the blood (methemoglobinemia) after a single ingestion. Conclusive data but not sufficient for classification.
Target organs	Blood

Specific target organ toxicity - repeated exposure

STOT - repeated exposure	Conclusive data but not sufficient for classification.
Target organs	Blood

Aspiration hazard

Aspiration hazard	No data available.

DISODIUM MONOMOLYBDATE DIHYDRATE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	2,733.0
Species	Rat
ATE oral (mg/kg)	2,733.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	2,001.0
Species	Rat
ATE dermal (mg/kg)	2,001.0

Skin corrosion/irritation

Animal data	Not irritating.

Serious eye damage/irritation

Serious eye damage/irritation	Not irritating.

Respiratory sensitisation

Respiratory sensitisation	Data lacking.

Skin sensitisation

Skin sensitisation	Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro	Negative.
Genotoxicity - in vivo	Negative.

Carcinogenicity

Carcinogenicity	Based on available data the classification criteria are not met.

Reproductive toxicity

Reproductive toxicity - fertility	Data lacking.

Specific target organ toxicity - single exposure

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STOT - single exposure Based on available data the classification criteria are not met.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Data lacking.

Aspiration hazard

Aspiration hazard Not considered an aspiration hazard.

SECTION 12: Ecological Information

Ecotoxicity The product is not expected to be hazardous to the environment. The product components are not classified as environmentally hazardous. However, large or frequent spills may have hazardous effects on the environment.

Ecological information on ingredients.

DISODIUM TETRABORATE PENTAHYDRATE

Ecotoxicity Boron occurs naturally in sea water at an average concentration of 5 mg B/l and fresh water at 1 mg B/l or less. In dilute aqueous solutions the predominant boron species present is undissociated boric acid.

12.1. Toxicity

Toxicity The product is not expected to be toxic to aquatic organisms.

Ecological information on ingredients.

ETHANEDIOL

Toxicity Product not classified as dangerous to aquatic organisms.

Acute toxicity - fish LC50, 96 hours: 72860 mg/l, Pimephales promelas (Fat-head Minnow)

Acute toxicity - aquatic invertebrates EC_{50}, 48 hours: > 100 mg/l, Daphnia magna

Acute toxicity - aquatic plants EC_{50}, 96 hours: 6500 - 13000 mg/l, Selenastrum capricornutum

Acute toxicity - microorganisms EC20, 30 minutes: > 1995 mg/l, Activated sludge

Chronic toxicity - fish early life stage NOEC, 7 days: 15380 mg/l, Pimephales promelas (Fat-head Minnow)

Chronic toxicity - aquatic invertebrates NOEC, 7 days: 8590 mg/l, Ceriodaphnia Sp.

DISODIUM TETRABORATE PENTAHYDRATE

Toxicity All toxicity values relate to Boron (Boron = Disodium Tetraborate Pentahydrate multiplied by 0.1484).

Acute toxicity - fish LC_{50}, 96 hours: 79.7 mg B/L, Pimephales promelas (Fat-head Minnow)

Acute toxicity - aquatic invertebrates LC_{50}, 48 hours: 133 mg B/L, Daphnia magna

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Acute toxicity - aquatic plants	EC_{50}, 72 hours: 40 mg B/L, Selenastrum capricornutum
Toxicity to terrestrial plants	Boron is an essential micronutrient for healthy growth of plants, however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimise the amount of borate product released to the environment.

SODIUM NITRITE

Toxicity	Very toxic to aquatic organisms.
Acute aquatic toxicity	
$LE(C)_{50}$	0.1 < L(E)C50 ≤ 1
M factor (Acute)	1
Acute toxicity - fish	LC50, 96 hours: 0.54 - 26.3 mg/l, Onchorhynchus mykiss (Rainbow trout)
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 15.4 mg/l, Daphnia magna
Acute toxicity - aquatic plants	EC_{50}, 72 hours: > 100 mg/l, Scenedesmus subspicatus
Acute toxicity - microorganisms	EC_{50}, 48 hours: 421 mg/l, Protozoa.
Chronic toxicity - aquatic invertebrates	NOEC, 80 days: 9.86 mg/l, Daphnia magna

DISODIUM MONOMOLYBDATE DIHYDRATE

Acute toxicity - fish	LC_{50}, 96 hours: 1536-1718 mg/l, Pimephales promelas (Fat-head Minnow)
Acute toxicity - aquatic invertebrates	LC_{50}, 48 hours: 330.1 mg/l, Daphnia magna
Acute toxicity - aquatic plants	EC_{50}, Effect on growth., 72 hours: 840 mg/l, Pseudokirchneriella subcapitata
Acute toxicity - microorganisms	EC_{50}, 3 hours: 216.5 mg/l, as Mo, Activated sludge

12.2. Persistence and degradability

Persistence and degradability	The product is biodegradable but it must not be discharged into drains without permission from the authorities. The product is degraded completely by photochemical oxidation.

Ecological information on ingredients.

ETHANEDIOL

Persistence and degradability	The product is biodegradable.
Biodegradation	Water - Degradation (%) 90 - 100%: 10 days Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% biodegradation in OECD test(s) for inherent biodegradability).

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DISODIUM TETRABORATE PENTAHYDRATE

Persistence and degradability Boron is naturally occurring and ubiquitous in the environment. Borax pentahydrate decomposes in the environment to natural borate.

SODIUM NITRITE

Persistence and degradability The product contains only inorganic substances which are not biodegradable.

DISODIUM MONOMOLYBDATE DIHYDRATE

Persistence and degradability Not applicable.

12.3. Bioaccumulative potential

Bioaccumulative potential The product does not contain any substances expected to be bioaccumulating.

Ecological information on ingredients.

ETHANEDIOL

Bioaccumulative potential Not potentially bioaccumulative

Partition coefficient log Pow: -1.36

DISODIUM TETRABORATE PENTAHYDRATE

Bioaccumulative potential The product is not bioaccumulating.

SODIUM NITRITE

Bioaccumulative potential The product does not contain any substances expected to be bioaccumulating.

DISODIUM MONOMOLYBDATE DIHYDRATE

Bioaccumulative potential Low potential.

12.4. Mobility in soil

Mobility The product is soluble in water. Volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Ecological information on ingredients.

ETHANEDIOL

Mobility The product is soluble in water. Volatilization from natural bodies of water or moist soil is not expected to be an important fate process. Potential for mobility in soil is very high.

Adsorption/desorption coefficient Water - Koc: ~ 1 @ °C

Henry's law constant ~ 8.05E-09 atm m3/mol @ 25°C

DISODIUM TETRABORATE PENTAHYDRATE

Mobility The product is soluble in water. Potential for mobility in soil is very high.

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SODIUM NITRITE

Mobility Adsorption to solid soil phase is expected.

DISODIUM MONOMOLYBDATE DIHYDRATE

Mobility Mobile in soils.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

Ecological information on ingredients.

ETHANEDIOL

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

DISODIUM TETRABORATE PENTAHYDRATE

Results of PBT and vPvB assessment PBT assessment does not apply.

SODIUM NITRITE

Results of PBT and vPvB assessment This substance is not classified as PBT or vPvB according to current EU criteria.

DISODIUM MONOMOLYBDATE DIHYDRATE

Results of PBT and vPvB assessment PBT assessment does not apply.

12.6. Other adverse effects

Other adverse effects Not applicable.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required.

Disposal methods Residues and empty containers should be taken care of as hazardous waste according to local and national provisions. Avoid the spillage or runoff entering drains, sewers or watercourses.

SECTION 14: Transport information

General The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

Road transport notes Not classified.

Rail transport notes Not classified.

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Sea transport notes Not classified.

Air transport notes Not classified.

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

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

National regulations Control of Pollution (Special Waste) Regulations 1980 (as amended).
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).

EU legislation Dangerous Substances Directive 67/548/EEC.
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

Guidance Workplace Exposure Limits EH40.
CHIP for everyone HSG228.
Introduction to Local Exhaust Ventilation HS(G)37.
Approved Classification and Labelling Guide (Sixth edition) L131.

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Revision comments NOTE: Lines within the margin indicate significant changes from the previous revision.

Issued by HS&E Manager.

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Revision date	14/02/2017
Revision	6
Supersedes date	11/01/2016
SDS number	20649
SDS status	Approved.
Hazard statements in full	H225 Highly flammable liquid and vapour. H272 May intensify fire; oxidiser. H290 May be corrosive to metals. H301 Toxic if swallowed. H302 Harmful if swallowed. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. H315 Causes skin irritation. H318 Causes serious eye damage. H319 Causes serious eye irritation. H331 Toxic if inhaled. H332 Harmful if inhaled. H335 May cause respiratory irritation. H360FD May damage fertility if swallowed. May damage the unborn child if swallowed. H370 Causes damage to organs (Central nervous system, Optic Nerve (Nervus Opticus)). H373 May cause damage to organs through prolonged or repeated exposure. H373 May cause damage to organs (Kidneys) through prolonged or repeated exposure if swallowed. H400 Very toxic to aquatic life. H411 Toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects.