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Atom N3 Odourless

MATERIAL SAFETY DATA SHEET

1. Identification of Product & Company.

Product Name - Atom N3 Odourless Neutraliser
Product Company - As stated above
Contact Name(s) - Mark/Mandy

2. Composition/Information on Ingredients

Chemical Identification - Sophisticated blend of surfactants

CAS Number - N/A – Product is a mixture
EC Number - N/A – Product is a mixture

3. Hazardous Identification

Danger Classification - None
Hazard Symbols - None

4. First Aid Measures

On Inhalation - None
Eye Contact - Wash with copious amounts of water
Skin Contact - Wash with soap and water
On Ingestion - Should any symptoms occur, seek medical attention

5. Fire Fighting Measures

Extinguishing Media - Not flammable

6. Accidental Release Measures

Flush away with copious amounts of water.

7. Storage & Handling

Handling - General good work practices.
Storage - 5 litre, 25 litre or 1000 litre containers in either metal or plastic store below 45°C as higher storage temperatures reduce the effectiveness of the product. Should not be stored close to caustics or strong bases.
Fire Protection - Product is water based non-flammable.

8. Exposure Controls and Personal Protection

General Protection - Good industrial practices of hygiene and care.
Respiratory - None
Hand - None.
Eye - None
Skin - None

9. Physical and Chemical Properties

Physical State - Clear Liquid
Odour - Odourless
Flash point – None
Viscosity - 2000 cps
Specific Gravity - 1.05 weight/volume
Vapour Density - None
Solubility in water - 100% in water

10. Stability & Reactivity

Reactivity - No known reaction to occur

Conditions to avoid - Temperatures above 45°C. PH below 3.5 above 9.5 will affect the quality and condition of the product. Caustics and strong bases will affect the quality and condition of the product.

11. Toxicological Information

Oral - LDSO – Levels of 5,000 mg/kg: No effects.
Non Toxic; “No warning required”.
Acute Toxicity - LDSO – Level of 10,000mg/kg: No effects after 168

hours.; Non-toxic; “No warning required.”

Skin Tests - Draize Test-Dermal score of .38; Non-irritant; “No warning required”.
Repeated Insult patch – no indication of irritation or Sensitization. Non-irritant; “No warning required”.

Inhalation Tests - Results. No possibility of irritation, Non-irritant; “No warning required”.

12. Ecological Information

- A natural bi-product of the fermentation industry
- Non-toxic natural product
- Contains a naturally occurring blend of unique surfactants

13. Disposal Considerations

Flush down sewage or drainage systems with copious amounts of water.

14 .Transport Information

Domestic Road/Rail - Unrestricted
Sea - Unrestricted
Air - Unrestricted
International Road and Rail - Unrestricted

15. Regulatory Information

“In accordance with national and local laws and practices”

The product is classified and labelled for supply in accordance with the chemicals (hazard information and packaging) regulations as follows.

Danger Classifications: In accordance with the chemicals (hazard information and packaging) regulations, this is not applicable.
Contains - None
Risk Phrases - None
Safety Phrases - Keep out of the reach of children. Keep container tightly closed.
“P” phrases - None

The information contained in this Safety Data Sheet does not constitute the user's own assessment of the workplace risks as required by other health and safety legislation.

We have compiled the information contained within this M.S.D.S. to the best of our knowledge and with the information available. The information contained in it is based on the present state of knowledge and current national legislation. It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

As specific conditions of use of the product are outside of the supplier's control, the user is responsible for ensuring that the requirements of relevant legislation are complied with.

The product's suitability in products and formulations and their applications should always be thoroughly checked by any user for its suitability to a particular use or product. Cobra Hydro UK Ltd cannot accept responsibility for any loss, injury or damage that may result from its use. The product should not be used for purposes other than those shown in Section 1 without first referring to the supplier and obtaining written instructions.

Please contact the company if any further information is required.

Date: 23/11/15

SAFETY DATA SHEET
Ferric sulfate solution 11% - 14%

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

1.1. Product identifier

Product name Ferric sulfate solution 11% - 14%

Synonyms; trade names Iron (III) sulfate solution

REACH registration number 01-2119513202-59

REACH registration notes Registered as the pure (dry) substance

CAS number 10028-22-5

EC number 233-072-9

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

Identified uses Treatment of drinking water, has received approval by the European Committee for Standardisation. Laboratory agent Use of selected iron salts in land remediation applications Treatment of waste water. Use of iron salts in biogas production Use of iron salts as precursors to pigments and other iron compounds Use in adhesives and sealants Catalyst. Fertiliser ingredient

1.3. Details of the supplier of the safety data sheet

Supplier

Industrial Chemicals Limited
Hogg Lane
Grays
Essex
RM17 5DU
United Kingdom
T:+44 (0)1375 389000
F:+44 (0)1375 389110
sds@icgl.co.uk

1.4. Emergency telephone number

Emergency telephone +44 (0)1865 407333 (24-hour)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Met. Corr. 1 - H290

Health hazards Acute Tox. 4 - H302 Eye Dam. 1 - H318 STOT SE 3 - H335

Environmental hazards Not Classified

Classification (67/548/EEC or 1999/45/EC) Xn;R22. C;R34.

2.2. Label elements

EC number 233-072-9

Ferric sulfate solution 11% - 14%

Pictogram


Signal word	Danger
Hazard statements	H290 May be corrosive to metals. H302 Harmful if swallowed. H318 Causes serious eye damage. H335 May cause respiratory irritation.
Precautionary statements	P234 Keep only in original container. P261 Avoid breathing vapour/ spray. P264 Wash contaminated skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P301+P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 Immediately call a POISON CENTER/ doctor. P330 Rinse mouth. P390 Absorb spillage to prevent material damage. P403+P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up. P406 Store in corrosive resistant container with a resistant inner liner. P501 Dispose of contents/ container in accordance with national regulations.
Contains	Ferric sulfate
Supplementary precautionary statements	P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P301+P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P310 Immediately call a POISON CENTER/ doctor. P406 Store in corrosive resistant/… container with a resistant inner liner.

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Ferric sulfate **30-60%**

CAS number: 10028-22-5 EC number: 233-072-9 REACH registration number: 01-2119513202-59

Classification
Met. Corr. 1 - H290
Acute Tox. 4 - H302
Skin Irrit. 2 - H315
Eye Dam. 1 - H318

Classification (67/548/EEC or 1999/45/EC)
Xn;R22. Xi;R38,R41.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Ferric sulfate solution 11% - 14%

Inhalation Move affected person to fresh air at once. Get medical attention. Check for lung congestion if NOx present.

Ingestion DO NOT induce vomiting. Get medical attention immediately. Rinse mouth thoroughly with water. Give plenty of water to drink. If confined to the mouth, rinse mouth thoroughly and ensure water is not swallowed. If swallowed, drink plenty of water.

Skin contact Remove contaminated clothing and rinse skin thoroughly with water. Get medical attention if any discomfort continues.

Eye contact Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention. Show this Safety Data Sheet to the medical personnel.

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

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

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media The product is non-combustible. However NOx will support combustion. Use fire-extinguishing media suitable for the surrounding fire. Dry chemicals. Water spray. Carbon dioxide (CO2).

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products Oxides of: Sulphur. Residual dissolved NOx

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Small Spillages: Flush away spillage with plenty of water. Large Spillages: Contain, neutralise with lime or soda ash, and dispose of in accordance with local regulations.

6.4. Reference to other sections

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Wear appropriate protective clothing. Avoid contact with skin and eyes. Avoid the formation of mists. If brown NOx gasses observed, do not breathe fumes. Do not wear contact lenses when handling this material.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Avoid contact with oxidising agents. Ensure adequate ventilation to avoid build up of NOx gasses Storage tanks and day tanks must be vented to the outside atmosphere, using suitable piping. Store away from the following materials: Store in vessels suitable for substances of low pH. Store away from the following materials: Alkalis. Avoid contact with metals (except 316 and 304 stainless steel).

Ferric sulfate solution 11% - 14%

7.3. Specific end use(s)

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

Ferric sulfate

Long-term exposure limit (8-hour TWA): 1 mg/m³
Short-term exposure limit (15-minute): 2 mg/m³

Ingredient comments Nitrogen oxides STEL (15min) 5ppm (nitrogen dioxide - OSHA limit). Immediately dangerous for life or health 20ppm (nitrogen dioxide - NIOSH); 8hr TWA 25ppm (nitric oxide - OSHA limit), Immediately dangerous for life or health 100ppm (nitric oxide - NIOSH)

Ferric sulfate (CAS: 10028-22-5)

Ingredient comments sulphuric acid TWA 0.05mg/m3

8.2. Exposure controls

Eye/face protection The following protection should be worn: Chemical splash goggles or face shield.

Hand protection It is recommended that gloves are made of the following material: Polyvinyl chloride (PVC). Rubber (natural, latex).

Other skin and body protection Plastic apron, sleeves, boots - if handling large quantities, full body suit.

Respiratory protection If mists are formed, a respirator must be worn. If brown NOx gasses are observed in a confined space, use self - contained breathing apparatus. If outside, move to upwind position.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance Liquid.

Colour Brown.

pH pH (concentrated solution): 0.5 - 1.0

Melting point < -20'C°C

Initial boiling point and range ~120'C°C @

Vapour density 1.04 (nitric oxide) & 1.58 (nitrogen dioxide)

Relative density 1.45 - 1.65 @ 20°C

Solubility(ies) (Of nitric oxide) 46ml/l at 20'C (62g/ton of water)

Viscosity 45 cP @ 20'C°C 90 cps at 5'C

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity N.B. Product produced by oxidation of ferrous sulfate with nitric acid. Some small quantities of residual nitrogen oxides may be given off (clearly visible reddish brown, and acrid odour) O: Oxidising, T+: very toxic, C: corrosive. Not believed to be carcinogenic or mutagenic.

10.2. Chemical stability

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Stability Do not store near sources of heat If diluted to <~1% in water, ferric hydroxide is formed and flocculates out. In the event of release to the aquatic environment, this process counteracts the potential hazards of the substance, and does not add significantly to the ubiquitous iron in the environment.

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid

Conditions to avoid Dilution to < ~ 1% results in ferric hydroxide formation In contact with some metals can generate hydrogen gas, which can form explosive mixtures with air.

10.5. Incompatible materials

Materials to avoid Powdered metal. Solid metals (except stainless steel).

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

ATE oral (mg/kg) 925.93

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg) 2,000.0

Species Rabbit

General information Product may give off small amounts of nitrogen oxides: low levels in the air can irritate the eyes, nose throat and lungs. Coughing, nausea, shortness of breath and tiredness may result. Higher levels of NOx can cause rapid burning, spasms, swelling of tissue in the respiratory tract, build up of fluids in the lung, and even death.

Inhalation Dust in high concentrations may irritate the respiratory system.

Ingestion May cause chemical burns in mouth, oesophagus and stomach. May cause liver and/or renal damage. Diarrhoea. Fibrosis of the pancreas. Irregular heartbeat, vomiting blood. Possibly fatal in large quantities.

Skin contact Irritating to skin. Prolonged and frequent contact may cause redness and irritation. Can cause burns by repeated / prolonged exposure

Eye contact Irritating to eyes. A single exposure may cause the following adverse effects: Corneal damage.

SECTION 12: Ecological Information

Ecotoxicity No data on possible environmental effects have been found. Due to its acidic nature, spillage of ferric sulfate solution may cause localised damage to plants. If diluted and neutralised no lasting effects will occur.

12.1. Toxicity

Acute toxicity - fish LC50, 96 hours: > 28 mg/l, Onchorhynchus mykiss (Rainbow trout)

Acute toxicity - aquatic invertebrates EC_{50}, 48 hours: 11 mg/l, Freshwater invertebrates

Chronic toxicity - aquatic invertebrates EC_{50}, 21 days: 4.5 mg/l, Freshwater invertebrates

Ferric sulfate solution 11% - 14%

12.2. Persistence and degradability

12.3. Bioaccumulative potential

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

12.6. Other adverse effects

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods Small amounts can be neutralised with lime or caustic soda, and washed away with copious amounts of water. Discharge of small quantities to the sewer with plenty of water may be permitted. The requirements of the local water authority must be complied with if contaminated water is flushed directly to the sewer. Larger quantities should be treated in a suitable plant or disposed of via a licensed waste disposal contractor. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. Do not dispose directly into rivers or drains

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 1760

UN No. (IMDG) 1760

UN No. (ICAO) 1760

14.2. UN proper shipping name

Proper shipping name (ADR/RID) CORROSIVE LIQUID, N.O.S.

Proper shipping name (IMDG) CORROSIVE LIQUID, N.O.S.

Proper shipping name (ICAO) CORROSIVE LIQUID, N.O.S.

Proper shipping name (ADN) CORROSIVE LIQUID, N.O.S.

14.3. Transport hazard class(es)

ADR/RID class 8

ADR/RID label 8

IMDG class 8

ICAO class/division 8

Transport labels

14.4. Packing group

ADR/RID packing group III

IMDG packing group III

ICAO packing group III

14.5. Environmental hazards

14.6. Special precautions for user

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EmS	F-A, S-B
Emergency Action Code	2X
Hazard Identification Number (ADR/RID)	80
Tunnel restriction code	(E)

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

SECTION 15: Regulatory information

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

National regulations	The Control of Substances Hazardous to Health Regulations 2002 (SI 2002 No. 2677) (as amended).
EU legislation	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).
Guidance	Workplace Exposure Limits EH40.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

General information	Ferric sulfate solution is used as a chemical for the treatment if drinking water, as approved by the European Committee for Standardisation under EN 890:2004. The transport and regulatory information given are in accordance with EN 890:2004, with R22 added. However, that document indicates ferric sulfate falls under packing group 1, as a "Substance presenting high danger". ICL believes that this classification is not justified for ferric sulfate, which only represents a low danger. 11.0% and 12.5% grades are assigned to Packing Group III, but the 8.5% grade is assigned to Packing Group II, because of the added sulfuric acid content. Some sedimentation can occur in this product. Even after filtering, slow sedimentation will occur. To avoid problems caused by this sedimentation, storage tanks should be cleaned every 1 to 2 years.
Revision comments	This is the first issue using the GHS Pro software package.
Issued by	D.Kelly
Revision date	30/08/2017
Revision	19
Supersedes date	13/08/2015
Risk phrases in full	R22 Harmful if swallowed. R34 Causes burns. R38 Irritating to skin. R41 Risk of serious damage to eyes.
Hazard statements in full	H290 May be corrosive to metals. H302 Harmful if swallowed. H315 Causes skin irritation. H318 Causes serious eye damage. H335 May cause respiratory irritation.

Ferric sulfate solution 11% - 14%

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 and its amendments

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

1.1. Product identifier

Product name: **FLOFOAM™ 380 F**

Type of product: Mixture.

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

Identified uses: Processing aid for industrial applications. Defoamer.

Uses advised against: All non-professional uses.

1.3. Details of the supplier of the safety data sheet

Company: SNF (UK) Limited
1 Red Hall Crescent, Paragon Business Village
Wakefield WF1 2DF
United Kingdom

Telephone: 01924-311000

Telefax: 01924-311099

E-mail address: sds@snf.com

1.4. Emergency telephone number

24-hour emergency number: +33 477 36 87 25

National Poison Information Service: NHS Direct: 0845 4647 or 111 (24/24, 7/7); Scotland: NHS 24 - 08454 24 24 24 (24/24, 7/7)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No.1272/2008:

Not classified.

2.2. Label elements

Labelling according to Regulation (EC) 1272/2008:

Hazard pictogram(s): None.

Signal word: None.

Hazard statement(s):	None.
Precautionary statement(s):	None.
Additional elements:	EUH208 - Contains Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1). May produce an allergic reaction EUH210 - Safety data sheet available on request

2.3. Other hazards

Spills produce extremely slippery surfaces.

PBT and vPvB assessment:
This information is not available.

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable, this product is a mixture.

3.2. Mixtures

Hazardous components

Petroleum distillates, hydrotreated heavy paraffinic

Concentration/ -range:	< 50%
EC-No.:	265-157-1
REACH Registration Number:	01-2119484627-25-XXXX
Classification according to Regulation (EC) No.1272/2008:	Asp. Tox. 1;H304

Notes:
Does not result in classification of the mixture if the kinematic viscosity is greater than 20.5 mm²/s measured at 40°C.

Alcohol alkoxylate

Concentration/ -range:	< 25%
EC-No.:	Polymer
REACH Registration Number:	Not applicable (polymer).
Classification according to Regulation (EC) No.1272/2008:	Aquatic Chronic 3;H412

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Concentration/ -range:	0.00015 - 0.0015%
ECHA List Number: *(Assigned by ECHA to substances without an EC Number)*	611-341-5
REACH Registration Number:	Exempt
Classification according to Regulation (EC) No.1272/2008:	Acute Tox. 3;H301, Acute Tox. 2;H310, Acute Tox. 2;H330, Skin Corr. 1C;H314, Eye Dam. 1;H318, Skin Sens. 1A;H317, Aquatic Acute 1;H400, Aquatic Chronic 1;H410, M = 100, EUH071

Notes:
Can be identified as Mixture of 5-chloro-2-methyl-4-isothiazolin-3-one (CAS 26172-55-4) and 2-methyl-4-isothiazolin-3-one (CAS 2682-20-4)

For explanation of abbreviations see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
If inhaled, remove to fresh air. Get medical attention if symptoms appear.

Skin contact:
Remove soaked clothing immediately and wash affected skin with soap and water. Get medical attention if irritation develops and persists.

Eye contact:
In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get prompt medical attention.

Ingestion:
Do NOT induce vomiting. Rinse mouth thoroughly with water and give large amounts of milk or water if person is conscious. Get medical attention.

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

Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

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

None reasonably foreseeable.

Other information:
None.

SECTION 5: Firefighting measures

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:
Water. Water spray. Foam. Carbon dioxide (CO2). Dry powder.
Warning! Spills produce extremely slippery surfaces.

Unsuitable extinguishing media:
High volume water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products:
Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides (COx).

5.3. Advice for firefighters

Protective measures:
Wear full protective clothing and self-contained breathing apparatus.

Other information:
Do not allow run-off from fire fighting to enter drains or water courses. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions:
Avoid contact with skin and eyes. Spills produce extremely slippery surfaces.

Protective equipment:
Wear adequate personal protective equipment (see Section 8 Exposure Controls/Personal Protection).

Emergency procedures:
Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.

6.2. Environmental precautions

As with all chemical products, do not flush into surface water. Try to prevent the material from entering drains or water courses. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3. Methods and material for containment and cleaning up

Small spills:
Do not flush with water.Use a non-combustable material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Large spills:
Do not flush with water. Prevent product from entering drains. Dam up. Use a non-combustable material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Residues:
After cleaning, flush away traces with water.

6.4. Reference to other sections

SECTION 7: Handling and storage; SECTION 8: Exposure controls/personal protection; SECTION 13: Disposal considerations;

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with the skin and the eyes. Use personal protective equipment. Wash hands before eating, drinking, or smoking.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from sources of ignition - No smoking. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipments must be grounded.
Incompatible with oxidizing agents.

7.3. Specific end use(s)

This information is not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

National occupational exposure limits:
None known.

Derived No and Minimum Effect Levels (DNELs/DMELs)

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Workers:

Long-term local effects:

Inhalation	0.02 mg/m³

Acute local effects:

Inhalation	0.04 mg/m³

Consumer:

Long-term systemic effects:

Ingestion	0.09 mg/kg/day

Acute systemic effects:

Ingestion	0.11 mg/kg/day

Long-term local effects:

Inhalation	0.02 mg/m³

Acute local effects:

Inhalation	0.04 mg/m³

Predicted no-effect concentrations (PNEC)

Petroleum distillates, hydrotreated heavy paraffinic

Oral (secondary poisoning):	9.33 mg/kg

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Freshwater:	3.39 µg/L
Intermittent release:	3.39 µg/L
Marine water:	3.39 µg/L
Sewage treatment plant:	0.23 mg/L
Sediment (freshwater):	0.027 mg/kg
Sediment (marine water):	0.027 mg/kg
Soil:	0.01 mg/kg
Oral (secondary poisoning):	The product is not expected to bioaccumulate.

8.2. Exposure controls

Appropriate engineering controls:

Use local exhaust if misting occurs. Natural ventilation is adequate in absence of mists.

Individual protection measures, such as personal protective equipment:

a) Eye/face protection:
Safety glasses with side-shields. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

b) Skin protection:

i) Hand protection: For prolonged or repeated contact use protective gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it.
ii) Other: Protective suit. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

c) Respiratory protection:
Use with adequate ventilation. Do not breathe vapor or mist. No personal respiratory protective equipment normally required. In case of insufficient ventilation wear suitable respiratory equipment. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

d) Additional advice:
Wash hands before breaks and at the end of workday. Wash hands before breaks and immediately after handling the product. Wash hands before eating, drinking, or smoking. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls:

Do not allow uncontrolled discharge of product into the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a) Appearance:	Liquid, Milky, Off-white.
b) Odour:	Hydrocarbon-like
c) Odour Threshold:	No data available.
d) pH:	Not applicable.
e) Melting point/freezing point:	No data available.
f) Initial boiling point and boiling range:	> 100°C
g) Flash point:	> 180°C
h) Evaporation rate:	No data available.
i) Flammability (solid, gas):	Not applicable.
j) Upper/lower flammability or explosive limits:	No data available.
k) Vapour pressure:	No data available.
l) Vapour density:	No data available.
m) Relative density:	0.9 - 1.0 @ 20°C (See Technical Bulletin or Product Specifications for a more precise value, if available)
n) Solubility(ies):	Negligible in water
o) Partition coefficient:	> 3.9
p) Autoignition temperature:	> 300°C
q) Decomposition temperature:	No data available.

r) Viscosity:	See Technical Bulletin.
s) Explosive properties:	Not applicable.
t) Oxidizing properties:	Not applicable.

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable at normal conditions.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

10.4. Conditions to avoid

Keep away from heat and sources of ignition.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides (COx).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on the product as supplied:

Acute oral toxicity:	LD50/oral/rat > 2000 mg/kg (Estimated)
Acute dermal toxicity:	The product is not expected to be toxic in contact with the skin.
Acute inhalation toxicity:	The product is not expected to be toxic by inhalation.
Skin corrosion/irritation:	The product is not expected to be irritating.
Serious eye damage/eye irritation:	The product is not expected to be irritating.
Respiratory/skin sensitisation:	The product contains a small amount of sensitising substances which may provoke an allergic reaction among sensitive individuals in contact with skin.
Mutagenicity:	Based on available data, product is not expected to be mutagenic.
Carcinogenicity:	Based on available data, product is not expected to be carcinogenic.
Reproductive toxicity:	Based on available data, product is not expected to be toxic for reproduction.

STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	No known effect.
Aspiration hazard:	Due to the viscosity, this product does not present an aspiration hazard.

Relevant information on the hazardous components:

Petroleum distillates, hydrotreated heavy paraffinic

Acute oral toxicity:	LD0/oral/rat > 5000 mg/kg (OECD 401)
Acute dermal toxicity:	LD0/dermal/rabbit > 5000 mg/kg (OECD 402)
Acute inhalation toxicity:	LC50/inhalation/4 hours/rat > 5.53 mg/L (OECD 403)
Skin corrosion/irritation:	Not irritating. (OECD 404)
Serious eye damage/eye irritation:	Not irritating. (OECD 405)
Respiratory/skin sensitisation:	Not sensitizing. (OECD 406)
Mutagenicity:	Based on available data, product is not expected to be mutagenic. In vitro tests showed mutagenic effects which were not observed with in vivo test. Not mutagenic. (OECD 474)
Carcinogenicity:	Based on available data, product is not expected to be carcinogenic. Carcinogenicity study in rats (OECD 451): Negative. Not carcinogenic. (OECD 453)
Reproductive toxicity:	Based on available data, product is not expected to be toxic for reproduction. NOAEL/rat >= 1000 mg/kg/day (OECD 421) Prenatal Development Toxicity Study (OECD 414) - NOAEL/Developmental toxicity/rat >= 2000 mg/kg/day
STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	Based on available data, product is not expected to demonstrate chronic toxic effects. LOAEL/oral/rat/90 days = 125 mg/kg/day (OECD 408) (Based on results obtained from tests on analogous products) NOAEC/inhalation/120 h/rat > 980 mg/m^3
Aspiration hazard:	May be fatal if swallowed and enters airways.

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Acute oral toxicity:	LD50/oral/rat = 64 - 66 mg/kg

Acute dermal toxicity:	LD50/dermal/rabbit = 87.12 mg/kg
Acute inhalation toxicity:	LC50/inhalation/4 hours/rat = 0.171 - 0.33 mg/L (aerosol / mist) (OECD 403)
Skin corrosion/irritation:	Causes burns. (OECD 404)
Serious eye damage/eye irritation:	Causes burns. (OECD 405)
Respiratory/skin sensitisation:	Sensitizing to skin. (OECD 406)
Mutagenicity:	Based on available data, product is not expected to be mutagenic. Not mutagenic. (OECD 472, 482) Positive in the Ames Test (OECD 471). Positive in the In vitro Mammalian Cell Gene Mutation Test (OECD 476). In vivo tests did not show mutagenic effects. (OECD 474, 475, 477, 486)
Carcinogenicity:	Based on available data, product is not expected to be carcinogenic. Carcinogenicity study in rat (OCDE 453): NOAEL = 17 - 27 mg/kg/day Carcinogenicity study in mice (OECD 451): Negative
Reproductive toxicity:	Based on available data, product is not expected to be toxic for reproduction. Two-Generation Reproduction Toxicity (OECD 416) - NOAEL/rat = 300 ppm Prenatal Development Toxicity Study (OECD 414) - NOAEL/Maternal toxicity/rat = 15 mg/kg/day - NOAEL/Developmental toxicity/rat = 15 mg/kg/day
STOT - Single exposure:	Corrosive to the respiratory tract.
STOT - Repeated exposure:	Based on available data, product is not expected to demonstrate chronic toxic effects. NOAEL/oral/rat/90 days = 16.3 - 24.7 mg/kg/day (OECD 408) NOAEC/inhalation/rat = 0.34 mg/m³ (aerosol / mist) (OECD 413)
Aspiration hazard:	No known effects.

SECTION 12: Ecological information

12.1. Toxicity

Information on the product as supplied:

Acute toxicity to fish:	LC50/Fish/96 hours > 100 mg/L (Estimated)
Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours > 100 mg/L (Estimated)
Acute toxicity to algae:	IC50/Algae/72 hours > 100 mg/L (Estimated)
Chronic toxicity to fish:	No data available.
Chronic toxicity to invertebrates:	No data available.

Toxicity to microorganisms:	No data available.
Effects on terrestrial organisms:	No data available.
Sediment toxicity:	No data available.

Relevant information on the hazardous components:

Petroleum distillates, hydrotreated heavy paraffinic

Acute toxicity to fish:	NOEC/Pimephales promelas/96 hours >= 100 mg/L (OECD 203)
Acute toxicity to invertebrates:	NOEC/Daphnia magna/96 hours >= 10000 mg/L (OECD 202)
Acute toxicity to algae:	NOEC/Pseudokirchneriella subcapitata/96 hours >= 10000 mg/L (OECD 201)
Chronic toxicity to fish:	NOEC/Oncorhynchus mykiss/14 days >= 1000 mg/L (Estimated)
Chronic toxicity to invertebrates:	NOEC/Daphnia magna/21 days = 10 mg/L (OECD 211)
Toxicity to microorganisms:	EC50/Tetrahymena pyriformis/ 40 h > 1000 mg/L.
Effects on terrestrial organisms:	No data available.
Sediment toxicity:	No data available.

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Acute toxicity to fish:	LC50/Oncorhynchus mykiss/96 hours = 0.19 mg/L (OECD 203) LC50/Lepomis macrochirus/96 hours = 0.28 mg/L
Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours = 0.16 mg/L (OECD 202)
Acute toxicity to algae:	IC50/Selenastrum capricornutum/72 hours = 0.027 mg/L (OECD 201)
Chronic toxicity to fish:	NOEC/Pimephales promelas/36 days = 0.02 mg/L (EPA OPP 72-4) NOEC/Oncorhynchus mykiss/28 days = 0.098 mg/L (OECD 215)
Chronic toxicity to invertebrates:	NOEC/Daphnia magna/21 days = 0.0036 mg/L (OECD 211)
Toxicity to microorganisms:	EC50/activated sludge/3 hours = 4.5 - 7.92 mg/L (OECD 209)
Effects on terrestrial organisms:	NOEC/Eisenia fetida/14 days = 5.07 - 14.47 mg/kg (OECD 207)
Sediment toxicity:	EC50/Sediment/28 days = 0.37 - 0.46 mg/kg

12.2. Persistence and degradability

Information on the product as supplied:

Degradation:	Expected to be biodegradable.
Hydrolysis:	Does not hydrolyse.
Photolysis:	No data available.

Relevant information on the hazardous components:

Petroleum distillates, hydrotreated heavy paraffinic

Degradation:	Inherently biodegradable.
Hydrolysis:	Does not hydrolyse.
Photolysis:	No data available.

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Degradation:	Inherently biodegradable. > 60% / 28 days (OECD 301 B, 301 D) (without fulfilling the 10-day window criterion) Half-life: 1.82 - 1.92 d (OECD 308)
Hydrolysis:	Does not hydrolyse. (@ pH 4 - 7)
Photolysis:	Half-life: 0.529 - 1.246 days

12.3. Bioaccumulative potential

Information on the product as supplied:

Partition co-efficient (Log Pow):	> 3.9
Bioconcentration factor (BCF):	No data available.

Relevant information on the hazardous components:

Petroleum distillates, hydrotreated heavy paraffinic

Partition co-efficient (Log Pow):	1.99 - 18.02
Bioconcentration factor (BCF):	No data available.

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Partition co-efficient (Log Pow): <= 0.75 (OECD 107)

Bioconcentration factor (BCF): <= 54 (OECD 305)

12.4. Mobility in soil

Information on the product as supplied:

No data available.

Relevant information on the hazardous components:

Petroleum distillates, hydrotreated heavy paraffinic

Koc: No data available.

Reaction mass of 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)

Koc: <= 310.4

12.5. Results of PBT and vPvB assessment

PBT assessment:
No data available.

vPvB assessment:
No data available.

12.6. Other adverse effects

None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products:

Dispose in accordance with local and national regulations. Can be landfilled or incinerated, when in compliance with local regulations.

Contaminated packaging:

If recycling is not practicable, dispose of in compliance with local regulations. Can be landfilled or incinerated, when in compliance with local and national regulations.

Recycling:

In accordance with local and national regulations.

SECTION 14: Transport information

Land transport (ADR/RID)

Not classified.

Sea transport (IMDG)

Not classified.

Air transport (IATA)

Not classified.

SECTION 15: Regulatory information

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

All components of this product have been registered or pre-registered with the European Chemicals Agency or are exempt from registration.

15.2. Chemical safety assessment

This information is not available.

SECTION 16: Other information

This data sheet contains changes from the previous version in section(s):

SECTION 3. Composition/information on ingredients, SECTION 6. Accidental release measures, SECTION 7. Handling and storage, SECTION 8. Exposure controls/personal protection, SECTION 11. Toxicological information, SECTION 12. Ecological information, SECTION 15. Regulatory information, SECTION 16. Other Information.

Key or legend to abbreviations and acronyms used in the safety data sheet:

Acronyms
PBT = persistent, bioaccumulative and toxic
STOT = Specific target organ toxicity
vPvB = very persistent and very bioaccumulative

Abbreviations
Acute Tox. 2 = Acute toxicity, Hazard Category 2
Acute Tox. 3 = Acute toxicity, Hazard Category 3
Aquatic Acute 1 = Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1 = Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 3 = Hazardous to the aquatic environment — Chronic Hazard, Category 3
Asp. Tox. 1 = Aspiration hazard, Hazard Category 1
Eye Dam 1 = Serious eye damage/eye irritation, Hazard Category 1
Skin Corr. 1C = Skin corrosion/irritation, Hazard Category 1C
Skin Sens. 1A = Sensitisation — Skin, hazard category 1A

Hazard statements
EUH071 - Corrosive to the respiratory tract
H301 - Toxic if swallowed
H304 - May be fatal if swallowed and enters airways
H310 - Fatal in contact with skin
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H330 - Fatal if inhaled
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects
H412 - Harmful to aquatic life with long lasting effects

Training advice:

Do not handle until all safety precautions have been read and understood.

This SDS was prepared in accordance with the following:

Regulation (EC) N°1907/2006, as amended
Regulation (EC) N°1272/2008, as amended

Version: 20.01.a

DEFM077

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 and its amendments

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

1.1. Product identifier

Product name: **FLOPAM™ EM 640 HIB**

Type of product: Mixture.

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

Identified uses: Processing aid for industrial applications.

Uses advised against: None.

1.3. Details of the supplier of the safety data sheet

Company: SNF (UK) Limited
1 Red Hall Crescent, Paragon Business Village
Wakefield WF1 2DF
United Kingdom

Telephone: 01924-311000

Telefax: 01924-311099

E-mail address: sds@snf.fr

1.4. Emergency telephone number

24-hour emergency number: +33 477 36 87 25

National Poison Information Service: NHS Direct: 0845 4647 or 111 (24/24, 7/7); Scotland: NHS 24 - 08454 24 24 24 (24/24, 7/7)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No.1272/2008:

Not classified.

2.2. Label elements

Labelling according to Regulation (EC) 1272/2008:

Hazard pictogram(s): None.

Signal word: None.

Hazard statement(s):	None.
Precautionary statement(s):	None.
Additional elements:	EUH210 - Safety data sheet available on request

2.3. Other hazards

Spills produce extremely slippery surfaces.

PBT and vPvB assessment:
Not PBT or vPvB according to the criteria of Annex XIII of REACH.

For explanation of abbreviations see Section 16.

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable, this product is a mixture.

3.2. Mixtures
This product is a mixture.

Hazardous components

Hydrocarbons, C12-C15, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Concentration/ -range:	20 - 30%
ECHA List Number: *(Assigned to substances without a CAS N° or other numerical identifier.)*	920-107-4
REACH Registration Number:	01-2119453414-43-XXXX
Classification according to Regulation (EC) No.1272/2008:	Asp. Tox. 1;H304

Notes:
Does not result in classification of the mixture if the kinematic viscosity is greater than 20.5 mm²/s measured at 40°C.

Isotridecanol, ethoxylated

Concentration/ -range:	< 5%
EC-No.:	Polymer
REACH Registration Number:	Not applicable (polymer).
Classification according to Regulation (EC) No.1272/2008:	Acute Tox. 4;H302, Eye Dam. 1;H318

For explanation of abbreviations see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Move to fresh air. No hazards which require special first aid measures.

Skin contact:
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. In case of persistent skin irritation, consult a physician.

Eye contact:
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention immediately.

Ingestion:
Rinse mouth with water. Do NOT induce vomiting. Call a physician or poison control centre immediately.

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

None under normal use.

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

None reasonably foreseeable.

Other information:
None.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media:
Water. Water spray. Foam. Carbon dioxide (CO2). Dry powder.
Warning! Spills produce extremely slippery surfaces.

Unsuitable extinguishing media:
None.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products:
Ammonia. Carbon oxides (COx). Nitrogen oxides (NOx). Hydrogen chloride. Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

5.3. Advice for fire-fighters

Protective measures:
Wear self-contained breathing apparatus and protective suit.

Other information:
Spills produce extremely slippery surfaces.

SECTION 6: Accidental release measures

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions:
Do not touch or walk through spilled material. Spills produce extremely slippery surfaces.

Protective equipment:
Wear adequate personal protective equipment (see Section 8 Exposure Controls/Personal Protection).

Emergency procedures:
Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.

6.2. Environmental precautions

As with all chemical products, do not flush into surface water.

6.3. Methods and material for containment and cleaning up

Small spills:
Do not flush with water.Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.

Large spills:
Do not flush with water.Dam up. Soak up with inert absorbent material. Clean up promptly by scoop or vacuum.

Residues:
After cleaning, flush away traces with water.

6.4. Reference to other sections

SECTION 7: Handling and storage; SECTION 8: Exposure controls/personal protection; SECTION 13: Disposal considerations;

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Renders surfaces extremely slippery when spilled. When using, do not eat, drink or smoke.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Freezing will affect the physical condition and may damage the material. Incompatible with oxidizing agents.

7.3. Specific end use(s)

This information is not available.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

National occupational exposure limits:
None known.

Derived No and Minimum Effect Levels (DNELs/DMELs)
None known.

Predicted no-effect concentrations (PNEC)
None known.

8.2. Exposure controls

Appropriate engineering controls:

Ensure adequate ventilation, especially in confined areas. Use local exhaust if misting occurs. Natural ventilation is adequate in absence of mists.

Individual protection measures, such as personal protective equipment:

a) Eye/face protection:
Safety glasses with side-shields.

b) Skin protection:
i) Hand protection: PVC or other plastic material gloves.
ii) Other: Wear coveralls and/or chemical apron and rubber footwear where physical contact can occur.

c) Respiratory protection:
No personal respiratory protective equipment normally required.

d) Additional advice:
Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday. Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls:

Do not allow uncontrolled discharge of product into the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a) Appearance:	Viscous liquid, Milky.
b) Odour:	Aliphatic.
c) Odour Threshold:	No data available.
d) pH:	3.5 - 6.5 @ 5 g/L
e) Melting point/freezing point:	< 5°C
f) Initial boiling point and boiling range:	> 100°C
g) Flash point:	Does not flash.
h) Evaporation rate:	No data available.
i) Flammability (solid, gas):	Not applicable.
j) Upper/lower flammability or explosive limits:	Not expected to create explosive atmospheres.
k) Vapour pressure:	2.3 kPa @ 20°C
l) Vapour density:	0.804 g/litre @ 20°C

m) Relative density:	1.0 - 1.2
n) Solubility(ies):	Completely miscible.
o) Partition coefficient:	Not applicable.
p) Autoignition temperature:	Not applicable.
q) Decomposition temperature:	> 150°C
r) Viscosity:	> 20.5 mm²/s @ 40°C
s) Explosive properties:	Not expected to be explosive based on the chemical structure.
t) Oxidizing properties:	Not expected to be oxidising based on the chemical structure.

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under recommended storage conditions.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Oxidizing agents may cause exothermic reactions.

10.4. Conditions to avoid

Protect from frost, heat and sunlight.

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition may produce: hydrogen chloride gas, nitrogen oxides (NOx), carbon oxides (COx). Ammonia. Hydrogen cyanide (hydrocyanic acid).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on the product as supplied:

Acute oral toxicity:	LD50/oral/rat > 5000 mg/kg (Estimated)
Acute dermal toxicity:	LD50/dermal/rat > 5000 mg/kg. (Estimated)
Acute inhalation toxicity:	The product is not expected to be toxic by inhalation.

Skin corrosion/irritation:	Non-irritating to skin.
Serious eye damage/eye irritation:	Not irritating. (OECD 437)
Respiratory/skin sensitisation:	Not sensitizing.
Mutagenicity:	Not mutagenic.
Carcinogenicity:	Not carcinogenic.
Reproductive toxicity:	Not toxic for reproduction.
STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	No known effect.
Aspiration hazard:	Due to the viscosity, this product does not present an aspiration hazard.

Relevant information on the hazardous components:

Hydrocarbons, C12-C15, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Acute oral toxicity:	LD50/oral/rat > 5000 mg/kg (OECD 401)
Acute dermal toxicity:	LD50/dermal/rabbit > 5000 mg/kg. (OECD 402)
Acute inhalation toxicity:	LC0/inhalation/4 hours/rat >= 4951 mg/m³ (OECD 403) (Based on results obtained from tests on analogous products)
Skin corrosion/irritation:	Not irritating. (OECD 404) Repeated exposure may cause skin dryness or cracking.
Serious eye damage/eye irritation:	Not irritating. (OECD 405)
Respiratory/skin sensitisation:	By analogy with similar products, this product is not expected to be sensitizing. (OECD 406)
Mutagenicity:	Not mutagenic. (OECD 471, 473, 474, 476, 478, 479)
Carcinogenicity:	Carcinogenicity study in rats (OECD 451): Negative.
Reproductive toxicity:	By analogy with similar substances, this substance is not expected to be toxic for reproduction. NOAEL/rat = 300 ppm. (OECD 421)
STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	NOAEL/oral/rat/90 days >= 3000 mg/kg/day (OECD 408) (Based on results obtained from tests on analogous products)
Aspiration hazard:	May be fatal if swallowed and enters airways.

Isotridecanol, ethoxylated

Acute oral toxicity:	LD50/oral/rat = 500 - 2000 mg/kg
Acute dermal toxicity:	LD50/dermal/rabbit > 2000 mg/kg.
Acute inhalation toxicity:	No data available.
Skin corrosion/irritation:	Not irritating. (OECD 404)
Serious eye damage/eye irritation:	Causes serious eye irritation. (OECD 405)
Respiratory/skin sensitisation:	The results of testing on guinea pigs showed this material to be non-sensitizing.
Mutagenicity:	In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects.
Carcinogenicity:	Based on the absence of mutagenicity, it is unlikely that the substance is carcinogenic.
Reproductive toxicity:	Two-Generation Reproduction Toxicity (OECD 416) - NOAEL/rat > 250 mg/kg/day Prenatal Development Toxicity Study (OECD 414) - NOAEL/Maternal toxicity/rat > 50 mg/kg/day - NOAEL/Developmental toxicity/rat > 50 mg/kg/day
STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	NOAEL/oral/rat/600 days = 50 mg/kg/day
Aspiration hazard:	No known effects.

SECTION 12: Ecological information

12.1. Toxicity

Information on the product as supplied:

Acute toxicity to fish:	LC50/Fish/96 hours = 10 - 100 mg/L (Estimated)
Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours = 10 - 100 mg/L. (Estimated)
Acute toxicity to algae:	Algal inhibition tests are not appropriate. The flocculation characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.
Chronic toxicity to fish:	No data available.
Chronic toxicity to invertebrates:	No data available.
Toxicity to microorganisms:	No data available.
Effects on terrestrial organisms:	No data available.
Sediment toxicity:	No data available.

Relevant information on the hazardous components:

Hydrocarbons, C12-C15, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Acute toxicity to fish:	LC0/Oncorhynchus mykiss/96 hours > 1000 mg/L. (OECD 203)
Acute toxicity to invertebrates:	EC0/Daphnia magna/48 hours > 1000 mg/L. (OECD 202)
Acute toxicity to algae:	IC0/Pseudokirchneriella subcapitata/72 hours > 1000 mg/L. (OECD 201)
Chronic toxicity to fish:	NOEC/Oncorhynchus mykiss/28 days > 1000 mg/L
Chronic toxicity to invertebrates:	NOEC/Daphnia magna/21 days > 1000 mg/L
Toxicity to microorganisms:	EC50/Tetrahymena pyriformis/ 48h > 1000 mg/L.
Effects on terrestrial organisms:	No data available.
Sediment toxicity:	No data available. Readily biodegradable, exposure to sediment is unlikely.

Isotridecanol, ethoxylated

Acute toxicity to fish:	LC50/Cyprinus carpio/96 hours = 1 - 10 mg/L (OECD 203)
Acute toxicity to invertebrates:	EC50/Daphnia/48 hours = 1 - 10 mg/L (OECD 202)
Acute toxicity to algae:	IC50/Desmodesmus subspicatus/72 hours = 1 - 10 mg/L (OECD 201)
Chronic toxicity to fish:	No data available.
Chronic toxicity to invertebrates:	NOEC/Daphnia magna/21 days > 1 mg/L (OECD 202)
Toxicity to microorganisms:	EC10/activated sludge/17 hours > 10000 mg/L (DIN 38412-8)
Effects on terrestrial organisms:	No data available.
Sediment toxicity:	No data available.

12.2. Persistence and degradability

Information on the product as supplied:

Degradation:	Readily biodegradable.
Hydrolysis:	At natural pHs (>6) the polymer degrades due to hydrolysis to more than 70% in 28 days. The hydrolysis products are not harmful to aquatic organisms.
Photolysis:	No data available.

Relevant information on the hazardous components:

Hydrocarbons, C12-C15, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Degradation:	Readily biodegradable. 67.6% / 28 days (OECD 301 F) ; 68.8% / 28 days (OECD 306) ; 61.2% / 61 days (OECD 304 A)
Hydrolysis:	Does not hydrolyse.
Photolysis:	No data available.

Isotridecanol, ethoxylated

Degradation:	Readily biodegradable. > 60% / 28 days (OECD 301 B)
Hydrolysis:	Does not hydrolyse.
Photolysis:	No data available.

12.3. Bioaccumulative potential

Information on the product as supplied:

The product is not expected to bioaccumulate.

Partition co-efficient (Log Pow):	Not applicable.
Bioconcentration factor (BCF):	No data available.

Relevant information on the hazardous components:

Hydrocarbons, C12-C15, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Partition co-efficient (Log Pow):	3 - 6
Bioconcentration factor (BCF):	No data available.

Isotridecanol, ethoxylated

Partition co-efficient (Log Pow):	> 3
Bioconcentration factor (BCF):	No data available.

12.4. Mobility in soil

Information on the product as supplied:

No data available.

Relevant information on the hazardous components:

Hydrocarbons, C12-C15, n-alkanes, isoalkanes, cyclics, < 2% aromatics

Koc: No data available.

Isotridecanol, ethoxylated

Koc: > 5000

12.5. Results of PBT and vPvB assessment

PBT assessment:
Not PBT according to the criteria of Annex XIII of REACH.

vPvB assessment:
Not vPvB according to the criteria of Annex XIII of REACH.

12.6. Other adverse effects

None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products:

Dispose in accordance with local and national regulations.

Contaminated packaging:

Rinse empty containers with water and use the rinse-water to prepare the working solution. If recycling is not practicable, dispose of in compliance with local regulations. Can be landfilled or incinerated, when in compliance with local regulations.

Recycling:

Store containers and offer for recycling of material when in accordance with the local regulations.

SECTION 14: Transport information

Land transport (ADR/RID)

Not classified.

Sea transport (IMDG)

Not classified.

Air transport (IATA)

Not classified.

SECTION 15: Regulatory information

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

All components of this product have been registered or pre-registered with the European Chemicals Agency or are exempt from registration.

15.2. Chemical safety assessment

A Chemical Safety Assessment for this product has been carried out by the person responsible for producing this Safety Data Sheet. All relevant information used to conduct this assessment are included in this Safety Data Sheet as well any as any resulting Risk Reduction Measures.

SECTION 16: Other information

This data sheet contains changes from the previous version in section(s):

SECTION 8. Exposure controls/personal protection, SECTION 15. Regulatory information, SECTION 16. Other Information.

Key or legend to abbreviations and acronyms used in the safety data sheet:

Acronyms
PBT = persistent, bioaccumulative and toxic
STOT = Specific target organ toxicity
vPvB = very persistent and very bioaccumulative

Abbreviations
Asp. Tox. 1 = Aspiration hazard, Hazard Category 1
Acute Tox. 4 = Acute toxicity, Hazard Category 4
Eye Dam 1 = Serious eye damage/eye irritation, Hazard Category 1

Hazard statements
H302 - Harmful if swallowed
H304 - May be fatal if swallowed and enters airways
H318 - Causes serious eye damage

This SDS was prepared in accordance with the following:

Regulation (EC) N°1907/2006, as amended
Regulation (EC) N°1272/2008, as amended

Version: 17.01.a

ENCC046

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

ANNEX(ES)

This product is not hazardous as supplied and/or does not contain hazardous components:

- which require REACH registration; or,
- which demonstrate relevant effects which would require a chemical safety assessment; or,
- which are present at concentrations above their cut-off value.

Therefore, according to Regulation (EC) No 1907/2006, Article 31, paragraph 7, an Exposure Scenario is not required as an annex to the Safety Data Sheet.

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 and its amendments

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

1.1. Product identifier

Product name: **FLOPAM™ FO 4650 VHM**

Type of product: Mixture.

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

Identified uses: Processing aid for industrial applications.

Uses advised against: None.

1.3. Details of the supplier of the safety data sheet

Company: SNF (UK) Limited
1 Red Hall Crescent, Paragon Business Village
Wakefield WF1 2DF
United Kingdom

Telephone: 01924-311000

Telefax: 01924-311099

E-mail address: sds@snf.fr

1.4. Emergency telephone number

24-hour emergency number: +33 477 36 87 25

National Poison Information Service: NHS Direct: 0845 4647 or 111 (24/24, 7/7); Scotland: NHS 24 - 08454 24 24 24 (24/24, 7/7)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No.1272/2008:

Not classified.

2.2. Label elements

Labelling according to Regulation (EC) 1272/2008:

Hazard pictogram(s): None.

Signal word: None.

Hazard statement(s):	None.
Precautionary statement(s):	None.
Additional elements:	EUH210 - Safety data sheet available on request

2.3. Other hazards

Aqueous solutions or powders that become wet render surfaces extremely slippery.

PBT and vPvB assessment:
Not PBT or vPvB according to the criteria of Annex XIII of REACH.

For explanation of abbreviations see Section 16.

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable, this product is a mixture.

3.2. Mixtures
This product is a mixture.

Hazardous components

Sulphamidic acid

Concentration/ -range:	2.5 - 10%
EC-No.:	226-218-8
REACH Registration Number:	01-2119982121-44-XXXX / 01-2119488633-28-XXXX
Classification according to Regulation (EC) No.1272/2008:	Skin Irrit. 2;H315, Eye Irrit. 2;H319, Aquatic Chronic 3;H412

For explanation of abbreviations see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Move to fresh air. Get medical attention if symptoms occur.

Skin contact:
Wash off with soap and plenty of water. Get medical attention if irritation develops and persists.

Eye contact:
Rinse immediately with plenty of water, also under the eyelids. Get medical attention.

Ingestion:
Rinse mouth. If conscious, give the victim plenty of water to drink. Induce vomiting, but only if victim is fully conscious.

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

Powder can cause localised skin irritation in folds of the skin or under tight clothing. Contact with dust can cause mechanical irritation or drying of the skin.

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

None.

Other information:
None.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media:
Water. Water spray. Foam. Carbon dioxide (CO2). Dry powder.
Warning! Aqueous solutions or powders that become wet render surfaces extremely slippery.

Unsuitable extinguishing media:
None.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products:
Thermal decomposition may produce: hydrogen chloride gas, nitrogen oxides (NOx), carbon oxides (COx). Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

5.3. Advice for fire-fighters

Protective measures:
No special protective equipment required. Wear self contained breathing apparatus for fire fighting if necessary.

Other information:
Aqueous solutions or powders that become wet render surfaces extremely slippery.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions:
Aqueous solutions or powders that become wet render surfaces extremely slippery.

Protective equipment:
Wear adequate personal protective equipment (see Section 8 Exposure Controls/Personal Protection).

Emergency procedures:
Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.

6.2. Environmental precautions

As with all chemical products, do not flush into surface water.

6.3. Methods and material for containment and cleaning up

Small spills:
Do not flush with water.Clean up promptly by sweeping or vacuum.

Large spills:
Do not flush with water. Prevent unauthorized access. Sweep up and shovel into suitable containers for disposal.

Residues:
Sweep up to prevent slip hazard. After cleaning, flush away traces with water.

6.4. Reference to other sections

SECTION 7: Handling and storage; SECTION 8: Exposure controls/personal protection; SECTION 13: Disposal considerations;

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Avoid dust formation. Avoid breathing dust. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Keep in a dry place. Incompatible with oxidizing agents.

7.3. Specific end use(s)

Processing aid for industrial applications.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

National occupational exposure limits:
None known.

Derived No and Minimum Effect Levels (DNELs/DMELs)

Sulphamidic acid

Workers:

Long-term systemic effects:

Skin contact	10 mg/kg/day
Inhalation	70.5 mg/m³

Consumer:

Long-term systemic effects:

Ingestion	5 mg/kg/day
Skin contact	5 mg/kg/day
Inhalation	17.4 mg/m^3

Predicted no-effect concentrations (PNEC)

Sulphamidic acid

Freshwater:	1.8 mg/L
Intermittent release:	0.48 mg/L
Marine water:	0.18 mg/L
Sewage treatment plant:	20 mg/L
Sediment (freshwater):	8.36 mg/kg
Sediment (marine water):	0.84 mg/kg
Soil:	5 mg/kg
Oral (secondary poisoning):	The product is not expected to bioaccumulate.

8.2. Exposure controls

Appropriate engineering controls:

Use local exhaust if dusting occurs. Natural ventilation is adequate in absence of dusts.

Individual protection measures, such as personal protective equipment:

a) Eye/face protection:
Safety glasses with side-shields.

b) Skin protection:
i) Hand protection: PVC or other plastic material gloves.
ii) Other: Workclothes protecting arms, legs and body.

c) Respiratory protection:
No personal respiratory protective equipment normally required. Dust safety masks recommended where working powder concentration is more than 10 mg/m^3.

d) Additional advice:
Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls:

Do not allow uncontrolled discharge of product into the environment. Do not flush into surface water.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a) Appearance:	Granular solid, white.
b) Odour:	None.
c) Odour Threshold:	Not applicable.
d) pH:	2.5 - 4.5 @ 5g/L
e) Melting point/freezing point:	> 100°C
f) Initial boiling point and boiling range:	Not applicable.
g) Flash point:	Not applicable.
h) Evaporation rate:	Not applicable.
i) Flammability (solid, gas):	Not combustible.
j) Upper/lower flammability or explosive limits:	Not expected to create explosive atmospheres.
k) Vapour pressure:	Not applicable.
l) Vapour density:	Not applicable.
m) Relative density:	0.6 - 0.9
n) Solubility(ies):	Soluble in water.
o) Partition coefficient:	< 0
p) Autoignition temperature:	Not applicable.
q) Decomposition temperature:	> 200°C
r) Viscosity:	See Technical Bulletin.
s) Explosive properties:	Not expected to be explosive based on the chemical structure.
t) Oxidizing properties:	Not expected to be oxidising based on the chemical structure.

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Hazardous polymerisation does not occur.

10.2. Chemical stability

Stable.

10.3. Possibility of hazardous reactions

Oxidizing agents may cause exothermic reactions.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition may produce: hydrogen chloride gas, nitrogen oxides (NOx), carbon oxides (COx). Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on the product as supplied:

Acute oral toxicity:	LD50/oral/rat > 5000 mg/kg
Acute dermal toxicity:	LD50/dermal/rat > 5000 mg/kg.
Acute inhalation toxicity:	The product is not expected to be toxic by inhalation.
Skin corrosion/irritation:	Not irritating.
Serious eye damage/eye irritation:	Testing conducted according to the Draize technique showed the material produces no corneal or iridial effects and only slight transitory conjuctival effects similar to those which all granular materials have on conjuctivae.
Respiratory/skin sensitisation:	The results of testing on guinea pigs showed this material to be non-sensitizing.
Mutagenicity:	Not mutagenic.
Carcinogenicity:	Not carcinogenic.
Reproductive toxicity:	Not toxic for reproduction.
STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	No known effect.
Aspiration hazard:	No hazards resulting from the material as supplied.

Relevant information on the hazardous components:

Sulphamidic acid

Acute oral toxicity:	LD50/oral/rat = 2065 - 2140 mg/kg

Acute dermal toxicity:	NOAEL/dermal/rat = 2000 mg/kg (OECD 402)
Acute inhalation toxicity:	The product is not expected to be toxic by inhalation.
Skin corrosion/irritation:	Not irritating. (OECD 404) (SNF)
Serious eye damage/eye irritation:	Moderately irritating to the eyes. (EPA OPPTS 870.2400)
Respiratory/skin sensitisation:	The product is not expected to be sensitizing.
Mutagenicity:	Negative in the Ames Test (OECD 471). Negative in the In vitro Mammalian Cell Gene Mutation Test (OECD 476). Not mutagenic. (OECD 472, 487)
Carcinogenicity:	Based on the absence of mutagenicity, it is unlikely that the substance is carcinogenic.
Reproductive toxicity:	Prenatal Development Toxicity Study (OECD 414) - NOAEL/Maternal toxicity/rat = 200 mg/kg/day - NOAEL/Developmental toxicity/rat = 200 mg/kg/day
STOT - Single exposure:	No known effects.
STOT - Repeated exposure:	No known effect.
Aspiration hazard:	No known effects.

SECTION 12: Ecological information

12.1. Toxicity

Information on the product as supplied:

Acute toxicity to fish:	LC50/Danio rerio/96 hours = 5 - 10 mg/L (OECD 203)
Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours = 20 - 50 mg/L. (OECD 202)
Acute toxicity to algae:	Algal inhibition tests are not appropriate. The flocculation characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.
Chronic toxicity to fish:	No data available.
Chronic toxicity to invertebrates:	No data available.
Toxicity to microorganisms:	No data available.
Effects on terrestrial organisms:	No data available. Readily biodegradable, exposure to soil is unlikely.
Sediment toxicity:	No data available. Readily biodegradable, exposure to sediment is unlikely.

Relevant information on the hazardous components:

Sulphamidic acid

Acute toxicity to fish:	LC50/Pimephales promelas/96 hours = 70.3 mg/L (OECD 203)
Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours = 71.6 mg/L. (OECD 202)
Acute toxicity to algae:	IC50/Scenedesmus subspicatus/72 hours = 48 mg/L (OECD 201)
Chronic toxicity to fish:	NOEC/Danio rerio/34 days >= 60 mg/L (OECD 210)
Chronic toxicity to invertebrates:	NOEC/Daphnia magna/21 days = 19 mg/L (OECD 211)
Toxicity to microorganisms:	EC50/activated sludge/3 hours > 200 mg/L (OECD 209)
Effects on terrestrial organisms:	No data available.
Sediment toxicity:	No data available.

12.2. Persistence and degradability

Information on the product as supplied:

Degradation:	Readily biodegradable.
Hydrolysis:	At natural pHs (>6) the polymer degrades due to hydrolysis to more than 70% in 28 days. The hydrolysis products are not harmful to aquatic organisms.
Photolysis:	No data available.

Relevant information on the hazardous components:

Sulphamidic acid

Degradation:	Not relevant (inorganic).
Hydrolysis:	Does not hydrolyse.
Photolysis:	No data available.

12.3. Bioaccumulative potential

Information on the product as supplied:

The product is not expected to bioaccumulate.

Partition co-efficient (Log Pow):	< 0
Bioconcentration factor (BCF):	No data available.

Relevant information on the hazardous components:

Sulphamidic acid

Partition co-efficient (Log Pow): -4.34 @ 20°C

Bioconcentration factor (BCF): No data available.

12.4. Mobility in soil

Information on the product as supplied:

No data available.

Relevant information on the hazardous components:

Sulphamidic acid

Koc: No data available.

12.5. Results of PBT and vPvB assessment

PBT assessment:
Not PBT according to the criteria of Annex XIII of REACH.

vPvB assessment:
Not vPvB according to the criteria of Annex XIII of REACH.

12.6. Other adverse effects

None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products:

Dispose in accordance with local and national regulations. Can be landfilled or incinerated, when in compliance with local regulations.

Contaminated packaging:

Rinse empty containers with water and use the rinse-water to prepare the working solution. If recycling is not practicable, dispose of in compliance with local regulations. Can be landfilled or incinerated, when in compliance with local regulations.

Recycling:

In accordance with local and national regulations.

SECTION 14: Transport information

Land transport (ADR/RID)

Not classified.

Sea transport (IMDG)

Not classified.

Air transport (IATA)

Not classified.

SECTION 15: Regulatory information

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

All components of this product have been registered or pre-registered with the European Chemicals Agency or are exempt from registration.

15.2. Chemical safety assessment

A Chemical Safety Assessment for this product has been carried out by the person responsible for producing this Safety Data Sheet. All relevant information used to conduct this assessment are included in this Safety Data Sheet as well any as any resulting Risk Reduction Measures.

SECTION 16: Other information

This data sheet contains changes from the previous version in section(s):

SECTION 5. Fire-fighting measures, SECTION 15. Regulatory information, SECTION 16. Other Information.

Key or legend to abbreviations and acronyms used in the safety data sheet:

Acronyms
PBT = persistent, bioaccumulative and toxic
STOT = Specific target organ toxicity
vPvB = very persistent and very bioaccumulative

Abbreviations
Eye Irrit. 2 = Serious eye damage/eye irritation, Hazard Category 2
Skin Irrit. 2 = Skin corrosion/irritation, Hazard Category 2
Aquatic Chronic 3 = Hazardous to the aquatic environment — Chronic Hazard, Category 3

Hazard statements
H319 - Causes serious eye irritation
H315 - Causes skin irritation
H412 - Harmful to aquatic life with long lasting effects

This SDS was prepared in accordance with the following:

Regulation (EC) N°1907/2006, as amended
Regulation (EC) N°1272/2008, as amended

Version: 17.01.a

PRCC009

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

ANNEX(ES)

This product is not hazardous as supplied and/or does not contain hazardous components:

- which require REACH registration; or,
- which demonstrate relevant effects which would require a chemical safety assessment; or,
- which are present at concentrations above their cut-off value.

Therefore, according to Regulation (EC) No 1907/2006, Article 31, paragraph 7, an Exposure Scenario is not required as an annex to the Safety Data Sheet.

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

1.1 Product Identifier

- **Product Name** AvantiGas Commercial Propane.

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

- **Identified Uses** Used as a domestic, commercial, industrial and automotive fuel, a feedstock in chemical processes.
- **Uses Advised Against** This product must not be used in applications other than those stated above without first seeking the advice of the supplier.

1.3 Details of the Supplier of the Safety Data Sheet

Supplier
Avanti Gas Limited
UGI House
Gisborne Close
Staveley
Chesterfield
Derbyshire
S43 3JT

Telephone +44 (0) 808 208 0000

Email enquiries@avantigas.com

1.4 Emergency Telephone Number

0870 753 9999

2. HAZARDS IDENTIFICATION

2.1 Classification and Labelling Elements According to Regulation 1272/2008 (CLP)

Regulation (EC) No 1272/2008 (CLP)	
Hazard Classes/Hazard Categories	**Hazard Statement**
Flammable Gas, Category 1	H220 – extremely flammable gas
Gases under pressure	H280 – contains gas under pressure, may explode if heated

2.2 Label Elements

- **Labelling According to Regulation (EC) No 1272/2008**
- **CLP Hazard Pictograms**

- **Signal Word** Danger

- **Hazard Statements** H220: Extremely Flammable gas.
  H280: under pressure; may explode if heated.
- **Health Hazards** Not classified as a health hazard under GHS criteria.
- **Environmental Hazards** Not classified as an environmental hazard under GHS criteria.

2.3 CLP Precautionary Statements

- **Prevention** P210: Keep away from heat/sparks/open flame/hot surfaces. No Smoking.
  P102: Keep out of reach of children.
  P243: Take precautionary measures against static discharge.
- **Response** P377: Leaking gas fire: Do not extinguish, unless leak can be stopped Safely.
  P381: Eliminate all ignition sources if safe to do so.
- **Storage** P403: Store in a well-ventilated place.
  P410: Protect from sunlight.

2.4 Other Hazards

- **Health Hazards** Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea.
  High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen.
  Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.
- **Safety Hazards** Vapours are heavier than air.
  Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.
  Electrostatic charges may be generated during pumping.
  Electrostatic discharge may cause fire.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

- **CAS No.** 74-98-6.

3.2 Mixtures

- **Preparation Description** Contains >80% Propane.
  It may also contain one or more of the following additives:
  - Odourant (usually ethyl mercaptan).
  - Anti-icing agents.
  - <0.1 %(m/m) 1, 3-butadiene (1, 3 butadiene not classed as carcinogen if <0.1%).
- **Hazardous Components** Classification of components according to Regulation (EC) No. 1272/2008.

Chemical Name	CAS No.	EINECS	REACH Registration No.	Conc.
Propane	74-98-6	200-827-9	Exempt	>=80%

Chemical Name	Hazard Class & Category	Hazard Statement
Propane	Flam. Gas, 1; Press. Gas, Liq. Gas;	H220; H280;

- **Additional Information:** Refer to Section 16 for full text of Hazard Precautionary Statements.

4. FIRST AID MEASURES

4.1 Description of First Aid Measures

- **General Notes** Do not enter area unless confirmed safe to do so.
  If possible, remove any affected person to uncontaminated safe Area.
- **Following Inhalation** Remove the affected person into fresh air. If breathing but unconscious, place in the recovery position.
  If breathing has stopped, apply artificial respiration.
  If heartbeat absent, give external cardiac compression.
  Monitor breathing and pulse. Seek urgent medical advice.
- **Following Skin Contact** In the event of frostbite, slowly warm the exposed area by rinsing with warm water.
  Obtain medical treatment immediately.
  Keep warm and at rest.
  Seek medical advice before removing clothing.
  Contaminated clothing may be a fire hazard and therefore should be soaked with water before being removed.
- **Following Eye Contact** Do not delay. Obtain medical advice immediately.
  Start to flush eye out with water.
  Remove contact lenses, if present and easy to do so.
  Continue rinsing. Flush eye with copious amounts of water.
- **Following Ingestion** Obtain medical attention immediately.

4.2 Most important symptoms/effects - acute and delayed

- High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.
- Continued exposure may result in unconsciousness and/or death.
- Contact with liquefied gas can cause frostbite due to rapid evaporative cooling.

4.3 Indication of immediate medical attention and special treatment needed

- Treat symptomatically. Administer oxygen if necessary.
- Treat frostbite with lukewarm water. Get immediate medical advice/attention.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media

- **Suitable Extinguishing Media** Shut off supply.

  If not possible and no risk to surroundings, let the fire burn itself out.

  If safe to do so use foam, water fog for major fires.

  Use dry chemical powder, carbon dioxide, sand or earth for minor fires.

- **Unsuitable Extinguishing Media** Do not use direct water jets on the burning product as they could cause a steam explosion and/or spread the fire.

  Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2 Special Hazards arising from the substance or mixture

- Hazardous combustion products may include: Carbon monoxide, Carbon Dioxide, Unidentified organic and inorganic compounds.
- Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapour Explosion (BLEVE).
- Contents are under pressure and can explode when exposed to heat or flames.
- The vapour is heavier than air, spreads along the ground and distant ignition is possible.

5.3 Advice for Fire Fighters

Wear full protective clothing and self-contained breathing apparatus.

Additional Advice Keep adjacent containers cool by spraying with water.

Fire Fighting - particularly with foam and water - may give rise to contaminants entering water courses.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Evacuate the area of all non-essential personnel.
- Call the Emergency Services if required.
- Shut off leaks, if possible, without taking personal risks.
- Ventilate contaminated area thoroughly.
- Avoid contact with spilled or released material.
- Remove all possible sources of ignition in the surrounding area.
- Attempt to disperse the gas or to direct its flow (e.g. by using fog sprays) to a safer location e.g. area free from ignition sources.
- Attempt to prevent the gas from entering low lying areas e.g. cellars, pits, drains, sewers or confined spaces.
- Attempt to prevent the gas from entering watercourses e.g. rivers, sewers.

- Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Confirm all electrical equipment is suitable for use in the area.
- Monitor area with combustible gas meter.
- Test atmosphere for flammable gas concentrations to ensure safe working conditions before personnel are allowed to enter the area.

6.2 Environmental Precautions

- Avoid loss of containment to the environment. Use appropriate containment methods to avoid environmental contamination.

6.3 Methods and Material for Containment and Clean Up

- **Small spillage** Allow to evaporate.

  Any Firefighting products should be contained using appropriate methods.
- **Large spillage** Notify Emergency Services. If trained and competent to do so attempt to disperse the vapour or to direct its flow to a safer location, e.g. by using fog sprays.

  Any Firefighting products should be contained using appropriate methods.

6.4 Reference to other Sections

- For guidance on the selection of Personal Protective Equipment, see Section 8 of this Safety Data Sheet.
- For guidance on the disposal of spilled material, see Section 13 of this Safety Data Sheet.

Additional Advice Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

Vapour may form an explosive mixture with air.

Risk of explosion. Inform the Emergency Services if product enters surface water drains.

7. HANDLING AND STORAGE

General Precautions

- Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
- Avoid breathing vapours or contact with material.
- Only use in well ventilated areas.
- Use local exhaust ventilation if there is a risk of inhaling vapours, mists or aerosols.
- Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.
- Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
- Air-dry contaminated clothing in a well-ventilated area before laundering.

7.1 Precautions for Safe Handling

- This product can create a low temperature exposure hazard when released as a liquid.
- Avoid prolonged or repeated contact with skin.
- Extinguish any naked flames.
- Do not smoke.
- Remove potential ignition sources, including portable electronic devices.
- Avoid any spark creation.
- Electrostatic charges may be generated during handling.
- Electrostatic discharge may cause fire.
- Earth all equipment.
- Use suitable Personal Protective Equipment, as described in Section 8 of this Safety Data Sheet.

7.2 Conditions for Safe Storage, Including any Incompatibilities

- Store only in purpose-designed, appropriately labelled pressure vessels or cylinders.
- Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat.
- Do not store near cylinders containing compressed oxygen or other strong oxidizers.

7.3 Specific End Uses

- AvantiGas cylinders containing Propane Gas must be transported and stored in the vertical position.
- Fork lift truck cylinders may be used vertically or horizontally on specifically designed applications.
- Protect cylinders from physical damage; do not drag, roll, slide or drop.

Additional Information This product is intended for use in closed systems only.

Ensure that all local regulations regarding handling and storage facilities are followed.

Exposure to this product should be reduced as low as reasonably practicable.

Reference should be made to the HSE (Health and Safety Executive) publication: “COSHH Essentials”.

Product Transfer Do not use compressed air for filling, discharging or handling.

Electrostatic charges may be generated during pumping.

Electrostatic discharge may cause fire.

Delivery lines may become cold enough to present a cold burns hazard

Recommended Materials For containers and container linings, use materials specifically approved for use with this product.

Examples of suitable materials are: PA-11, PEEK, PVDF, PTFE, GRE (Epoxy), GRVE (vinyl ester), Viton (FKM), type F and GB, Neoprene (CR).

Unsuitable Materials Some forms of cast iron. Examples of materials to avoid are: ABS, polymethyl methacrylate (PMMA), polyethylene (PE/HDPE), polypropylene

	(PP), PVC, natural rubber (NR), Nitrile (NBR), ethylene propylene rubber (EPDM), butyl (IIR), hypalon (CSM), polystyrene, polyvinyl chloride (PVC), polyisobutylene. For containers and container linings, aluminium should not be used if there is a risk of caustic contamination of the product.
Container Materials	Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m³
Propane (no specific reference in EH40. See liquefied petroleum gas)	EH40	TWA (8-hour reference period)	1,000 ppm	1,750mg/m³
	EH40	STEL (15-minute reference period)	1,250 ppm	2,180mg/m³

Material	Source	Hazard Designation
Propane (no specific reference in EH40. See liquefied petroleum gas)	EH40	Carc (only applies if LPG contains more than 0.1% of buta-1, 3-diene)

8.2 Exposure Controls

General Information

- The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
- Select controls based on a risk assessment of local circumstances.

8.2.1 Appropriate Engineering Controls

- Consider using a “Permit to Work System”.
- Use sealed systems as far as possible.
- Ensure adequate air ventilation.
- Use adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
- Local exhaust ventilation is recommended.

- Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls.
- Keep concentrations well below lower explosion limits (see Section 9 for more information on flammability limits).
- Use gas monitors if flammability limits may be exceeded.
- Products to be used in closed systems only.
- Monitor systems for leaks.
- Use suitable materials for containment systems.

8.2.2 Individual Protection Measures (such as Personal Protective Equipment)

- **General** — Personal Protective Equipment (PPE) should meet Recommended.
  National standards. Check with PPE suppliers on specific requirements.
- **Eye/Face Protection** — Chemical splash goggles (gas-tight mono-goggles) and face shield with chin guard - Approved to EU Standard EN166.
- **Skin Protection (Hands)** — Personal hygiene is a key element of effective hand care. Gloves must be worn on clean hands.

  After using gloves, hands should be washed and dried thoroughly.

  Application of a non-perfumed moisturiser is recommended.

  Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, and dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.

  Where hand contact with the product may occur the use of gloves approved to relevant standards e.g. EN 374, made from the following materials may provide suitable chemical protection: Neoprene rubber. Nitrile rubber. If contact with liquefied product is possible or anticipated, gloves should be thermally insulated to prevent cold burns e.g. EN 511.
  - **Skin Protection (Other)** — Chemical resistant, fire retardant, anti-static clothing and cold resistant gloves/gauntlets, safety boots and apron.
  - **Respiratory Protection** — If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
    Check with respiratory protective equipment suppliers on specific requirements.

    Before any such respiratory protection is used, the wearer must be trained and competent in its use and any limitations.

	Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapours (boiling point <65 °C (149 °F)).
• **Thermal Hazards**	When handling cold material that can cause frost burns, wear cold resistant, thermal gloves, safety hat and visor, fire retardant, anti-static, cold resistant overalls (with cuffs over gloves and legs over boots) and heavy duty boots e.g. leather for cold resistance.

8.2.3 Environmental Exposure Controls

- Local guidelines on emission limits for volatile substances control measures must be observed for the discharge of exhaust air containing vapour.
- For guidance on Waste Control Measures see Section 13

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

• **Appearance**	Colourless liquid under pressure.
• **Odour**	Odourless, if unstenched.
• **Odour Threshold**	No data available.
• **pH**	Not applicable.
• **Melting point / Freezing Point**	Typical: 187.6 °C/-305.7 °F.
• **Initial Boiling Point and Boiling Range**	Typical: -40 °C/-40 °F 1,013 hPa.
• **Flash point**	Typical: -104 °C/- 155°F.
• **Evaporation rate**	Data not available.
• **Flammability (solid/gas)**	Flammable Gas.
• **Upper/Lower Flammability or Explosion Limits**	Typical 1.7 - 10.9 %(V).
• **Vapour Pressure**	ca. 980 kPa at 20 °C/68 °F.
• **Vapour Density (air =1)**	1.56 (0 °C).
• **Relative Density**	Typical: 500 - 510 kg/m3 at 15 °C/59 °F.
• **Solubility**	Negligible.
• **Partition Coefficient n-octanol/Water**	ca. 2.3.
• **Auto-ignition Temperature**	Typical: 450 °C/842 °F.
• **Decomposition Temperature**	650 °C Decomp to ethylene and ethane.
• **Viscosity**	
- **Kinematic**	Not applicable.
- **Dynamic**	0.08mPa.s (17.9 °C).

- **Explosive Properties** Not applicable.
- **Oxidising Properties** Not applicable.

9.2 Other Information

- Gas vapour heavier than air.
- May accumulate in confined spaces particularly at or below ground level.
- Molecular Weight: 44.1g/mol (C3H8).

10. STABILITY AND REACTIVITY

Reactivity	Product will not become self-reactive.
Chemical Stability	No known hazardous reactions.
Possibility of Hazardous Reactions	No known hazardous reactions.
Conditions to Avoid	Potential Ignition sources e.g. Heat, open flames, electrical equipment not suitable for area. Creation of flammable atmospheres. Incompatible materials.
Incompatible Materials	Strong oxidising agents (e.g. Chlorates & Nitrates).
Hazardous Decomposition Products	Hazardous decomposition products are not expected to form during normal storage. If combusted, compounds of Carbon Dioxide and Carbon Monoxide will be released to atmosphere during any fire. Carbon Monoxide may be release due to incomplete combustion.

11. TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Basis for Assessment	Information given is based on product data, a knowledge of the components and the toxicology of similar products.
Likely Routes of Exposure	Inhalation is the primary route of exposure although exposure may occur through skin or eye contact.

- **Acute Toxicity**
  - **Acute Oral Toxicity** Not applicable.
  - **Acute Dermal Toxicity** Not applicable.
- **Skin Corrosion/Irritation** Not irritating to skin.
- **Serious Eye Damage/Irritation** Essentially non-irritating to eyes.
- **Respiratory Irritation** Inhalation of vapours or mists may cause irritation. to the respiratory system.
- **Respiratory or Skin Sensitisation** Not expected to be a sensitiser.
- **Germ Cell Mutagenicity** No evidence of mutagenic activity.

• **Carcinogenicity**	Not expected to be carcinogenic.
• **Reproductive Toxicity**	Not expected to impair fertility. Not a developmental toxicant.
• **Specific Target Organ Toxicity - Single Exposure**	High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
• **Specific Target Organ Toxicity - Repeated Exposure**	Low systemic toxicity on repeated exposure.
• **Aspiration Hazard**	Not considered an aspiration hazard.

12. ECOLOGICAL INFORMATION

Basis for Assessment	Information given is based on product testing, and/or similar products, and/or components.
Toxicity	Physical properties indicate that petroleum gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice.
Persistence and Degradability	Expected to be readily biodegradable. Oxidises rapidly by photo-chemical reactions in air.
Bioaccumulative Potential	Not expected to bioaccumulate significantly.
Mobility in Soil	Because of their extreme volatility, air is the only environmental compartment that hydrocarbon gases will be found.
Result of the PBT and vPvB Assessment	Not classified as PBT or vPvB.
Other Adverse Effects	In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

13.1.1 Product/Packaging Disposal

Product Disposal

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 dispose into the environment, in drains or in water courses.

Given the nature and uses of this product, the need for disposal seldom arises.

If necessary, dispose by controlled combustion in purpose-designed equipment.

If this is not possible, contact the supplier.

Packaging Disposal	Return part-used or empty cylinders to the supplier. For tanks seek specialist advice from suppliers. Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Waste Treatment	Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Other Disposal Recommendations	Disposal should be in accordance with all applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with. EU Waste Disposal Code (EWC): 16 05 04 gases in pressure containers (including halons) containing dangerous substances.

14. TRANSPORT INFORMATION

		Transport Category				
		Land Transport		Inland Waterways Transport (ADN)	Sea Transport (IMDG)	Air Transport (IATA)
		ADR	RID			
14.1	**UN No**	1978				
14.2	**Un Proper Shipping Name**	Propane				
14.3	**Transport Hazard Class**	2				
	Transport Hazard Label	2.1				
14.4	**Packing Group**	Not applicable				
14.5	**Environmental hazard**	No				
14.6	**Special Precautions for User**	Special Precautions: Refer to Section 7: Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport				
14.7	**Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code**	Not applicable				

Additional Information

- 2YE: Emergency Action Code (UK CDG).
- 23: Hazard Identification Number (EU ADR).
- IATA - forbidden for transport on passenger aircraft.

- Avoid transport on which the load space is not separated from the driver's compartment.
- Ensure vehicle driver is trained in the transport of this substance - including accident and emergency procedures.
- The transport information is not intended to convey all specific regulatory data relating to this material.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- Environmental Protection Act 1990 (as amended).
- Health and Safety at Work etc. Act 1974.
- Consumers Protection Act 1987.
- Control of Pollution Act 1974.
- Environmental Act 1995.
- Factories Act 1961.
- ADR 2017.
- IMDG 2016.ADN 2017.
- RID 2017.
- CDG Regulations 2009 (as amended).
- IATA Dangerous Goods Regulations 2017.
- RIDDOR Regulations 2013.
- Health and Safety (First Aid) Regulations 1981 (as amended).
- Personal Protective Equipment Regulations 2002.
- Personal Protective Equipment at Work Regulations 1992 (as amended).
- COMAH Regulations 2015.
- DSEAR Regulations 2002.
- CLP Regulation 2008.
- Pressure Systems Safety Regulations 2000.
- REACH Regulations 2006 (as amended).
- EH40 Regulations 2005.

15.2 Chemical Safety Assessment

- No chemical safety assessment has been performed for this substance due to its REACH (Annex V) exemption.

16. OTHER INFORMATION

This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.

CLP Hazard Statements	H220: Extremely flammable gas. H280: Contains gas under pressure; may explode if heated.
SDS Distribution	If the product is supplied to a downstream user or distributor and they request a Safety Data Sheet, it must be supplied. The Safety Data Sheet need not be supplied where hazardous substances or mixtures offered or sold to the general public are provided with sufficient information to enable users to take the necessary measures as regards the protection of human health, safety.

16.1 Abbreviations & Acronyms

ADN European Agreement Concerning the International Carriage of Dangerous Goods by Inland waterways.

ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road.

CAS Chemical Abstract Service Number.

CDG The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations.

CLP Classification Labelling & Packaging Regulation (EC No. 1272/2008).

COMAH Control of Major Accident Hazards.

DSEAR The Dangerous Substances and Explosive Atmospheres Regulations.

EH40 Workplace exposure limits 2005 - containing the list of workplace exposure limits for use with the Control of Substances Hazardous to Health Regulations.

EINECS European Inventory of Existing Commercial Chemical Substances.

EN European Standard.

GHS Global Harmonised System of Classification and Labelling of Chemicals.

IMDG International Maritime Dangerous Goods Code.

OEL Occupational Exposure Limit.

PBT Persistent Bio accumulative and Toxic.

vPvB Very Persistent and Very Bio accumulative.

PPE Personal Protective Equipment.

PSSR The Pressure Systems Safety Regulations.

REACH Registration, Evaluation, Authorisation and Restriction of Chemicals.

RID Regulations Concerning the International Carriage of Dangerous Goods by Rail.

RIDDOR Reporting of Injuries, Diseases and Dangerous Occurrences Regulations.

SDS Safety Data Sheet.

STEL Short-Term Exposure Limit.

TWA Time-Weighted Averages.

WEL Workplace Exposure Limit.

16.2 Safety Data Sheet

Version Number	1.8
Effective Date	18.10.2017
Revision	This Safety Data Sheet has been revised in accordance with the changes required by REACH and CLP.
Changes Made	Section 1 - Update of contact address. Section 2/3 - Removal of CHIP information. Section 9/11 - Restructure addition of information where required to REACH/CLP guidelines. Section 7.3 - Additional information on use of cylinders.

No specific chemical or technical information has been changed in this SDS.

No additional restrictions have been added to this SDS in regards to the REACH/CLP guidelines.

SDS Regulation	Regulation 1907/2006/EC.
Disclaimer	The information within this Safety Data Sheet is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not, therefore, be construed as guaranteeing any specific property of the product.

This Safety Data Sheet has been prepared in accordance with the requirements of Article 31 of EU Regulation 1907/2006 (as amended) on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). This substance is exempted from REACH Registration as per the provisions of Article 2(7) (a)and Annex IV.

SAFETY DATA SHEET
Polyaluminium Chloride Solution, 18%

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

1.1. Product identifier

Product name Polyaluminium Chloride Solution, 18%

Synonyms; trade names PAC, PACL, Polyaluminium Chloride Hydroxide Sulfate, Aluminium chloride hydroxide sulfate, Aluminium hydroxychlorosulfate

REACH registration number 01-2119531540-51

CAS number 39290-78-3

EC number 254-400-7

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

Identified uses Treatment of drinking water, has received approval by the European Committee for Standardisation. Treatment of waste water.

1.3. Details of the supplier of the safety data sheet

Supplier

Industrial Chemicals Limited
Hogg Lane
Grays
Essex
RM17 5DU
United Kingdom
T:+44 (0)1375 389000
F:+44 (0)1375 389110
sds@icgl.co.uk

1.4. Emergency telephone number

Emergency telephone +44 (0)1865 407333 (24-hour)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Met. Corr. 1 - H290

Health hazards Eye Dam. 1 - H318

Environmental hazards Not Classified

Classification (67/548/EEC or 1999/45/EC) C;R34.

2.2. Label elements

EC number 254-400-7

Polyaluminium Chloride Solution, 18%

Pictogram

Signal word	Danger
Hazard statements	H290 May be corrosive to metals. H318 Causes serious eye damage.
Precautionary statements	P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Take off immediately all contaminated clothing. P406 Store in corrosive resistant/… container with a resistant inner liner.

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name	Polyaluminium Chloride Solution, 18%
REACH registration number	01-2119531540-51
CAS number	39290-78-3
EC number	254-400-7
Composition comments	The product is formed by the action of hydrochloric and sulfuric acids on aluminium trihydroxide, to mgive a solution in water. Total aluminium content is 9.6% (18% as Al2O3); total strength as PAC is about 40%

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Remove affected person from source of contamination. Keep affected person warm and at rest. Get medical attention immediately.
Ingestion	Never give anything by mouth to an unconscious person. Do not induce vomiting. Rinse mouth thoroughly with water. Get medical attention immediately.
Skin contact	Remove affected person from source of contamination. Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention promptly if symptoms occur after washing.
Eye contact	Remove affected person from source of contamination. Remove any contact lenses and open eyelids wide apart. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention immediately. Continue to rinse.

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

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

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media The product is not flammable. Use fire-extinguishing media suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

Polyaluminium Chloride Solution, 18%

Hazardous combustion products Fire or high temperatures create: Thermal decomposition or combustion products may include the following substances: Corrosive gases or vapours. Hydrogen chloride (HCl). Sulphurous gases (SOx).

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. Avoid breathing fire gases or vapours. Wear acid-resistant protective clothing

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Avoid discharge into drains or watercourses or onto the ground. Contain spillage with sand, earth or other suitable non-combustible material.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Stop leak if possible without risk. Contain and absorb spillage with sand, earth or other non-combustible material. Collect and place in suitable waste disposal containers and seal securely. Label the containers containing waste and contaminated materials and remove from the area as soon as possible. Flush contaminated area with plenty of water.

6.4. Reference to other sections

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid spilling. Avoid contact with skin and eyes. Wear suitable protective equipment for prolonged exposure and/or high concentrations of vapours, spray or mist. Eye wash facilities and emergency shower must be available when handling this product.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Use containers made of the following materials: Suitable plastic material. Polyethylene-lined mild steel.

Storage class Corrosive storage.

7.3. Specific end use(s)

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Ingredient comments WEL = Workplace Exposure Limits

Biological limit values 2 mg/m3, 8-hour TWA (soluble Al salts), 2 mg/m3, 8-hour TWA (soluble Al salts), 2 mg/m3, 8-hour TWA (soluble Al salts)

8.2. Exposure controls

Protective equipment

Appropriate engineering controls Provide adequate ventilation. Avoid inhalation of vapours. Observe any occupational exposure limits for the product or ingredients.

Polyaluminium Chloride Solution, 18%

Eye/face protection	Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. The following protection should be worn: Chemical splash goggles or face shield.
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible.
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact. Wear rubber footwear.
Hygiene measures	Provide eyewash station and safety shower. Do not smoke in work area. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.
Respiratory protection	No specific recommendations. Respiratory protection may be required if excessive airborne contamination occurs.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Light (or pale). Yellow.
Odour	Almost odourless.
pH	pH (concentrated solution): 0.5 - 1.0
Melting point	Below -25°C
Vapour pressure	30 mm Hg @ 0C @ °C
Relative density	1.39 @ °C
Solubility(ies)	Miscible with water. Dilute solutions hydrolyse to precipitate Al(OH)3
Viscosity	30 cP at 20C @ °C

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	In contact with some metals can generate hydrogen gas, which can form explosive mixtures with air.

10.2. Chemical stability

Stability	Stable at normal ambient temperatures.

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid

Conditions to avoid	Avoid excessive heat for prolonged periods of time. Avoid contact with acids.

10.5. Incompatible materials

Materials to avoid	Avoid contact with chlorites, hypochlorites, and sulfites Incompatible with other aluminium salts and iron salts. Special care must be taken regarding mixing with products previously used in order to avoid gel formation or precipitation.

10.6. Hazardous decomposition products

Polyaluminium Chloride Solution, 18%

Hazardous decomposition products Thermal decomposition or combustion products may include the following substances: Hydrogen chloride (HCl).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Inhalation May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

Ingestion May cause burns in mucous membranes, throat, oesophagus and stomach.

Skin contact May cause serious chemical burns to the skin.

Eye contact Causes burns.

SECTION 12: Ecological Information

Ecotoxicity Not regarded as dangerous for the environment.

12.1. Toxicity

12.2. Persistence and degradability

Stability (hydrolysis) Hydrolyses when diluted in water, forming Al(OH)3.

12.3. Bioaccumulative potential

Bioaccumulative potential The product is not bioaccumulating.

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

12.6. Other adverse effects

Other adverse effects Product is acidic, and will reduce the pH of water courses and drains, and cause damage to flora and fauna. It should not be allowed to enter controlled waters in large quantities - in such causes the National Rivers Authority should be contacted.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods Do not dispose directly into rivers or drains.
Small spills may be neutralised with sodium carbonate, lime, or calcium carbonate, and flushed to sewer.
Large amounts of aluminium salts should be contained, and then be neutralised with a weak alkali solution. The resulting suspension (mainly alumina) may be regarded as neutral waste and disposal should be in accordance with local or state or national legislation.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 3264

UN No. (IMDG) 3264

UN No. (ICAO) 3264

14.2. UN proper shipping name

Proper shipping name (ADR/RID) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Polyaluminium Chloride Solution)

Proper shipping name (IMDG) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Polyaluminium Chloride Solution)

Polyaluminium Chloride Solution, 18%

Proper shipping name (ICAO) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Polyaluminium Chloride Solution)

Proper shipping name (ADN) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Polyaluminium Chloride Solution)

14.3. Transport hazard class(es)

ADR/RID label 8

IMDG class 8

ICAO class/division 8

Transport labels

14.4. Packing group

ADR/RID packing group II

IMDG packing group II

ICAO packing group II

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user

Emergency Action Code 2X

Hazard Identification Number (ADR/RID) 80

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

SECTION 15: Regulatory information

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

National regulations The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).

EU legislation This product has been approved as a chemical used for the treatment of drinking water, under the appropriate BS EN Standard (see Sales Specification), and so it is also approved by the British Drinking Water Inspectorate.

Guidance Workplace Exposure Limits EH40.
CHIP for everyone HSG228.
Approved Classification and Labelling Guide (Sixth edition) L131.
Safety Data Sheets for Substances and Preparations.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

Polyaluminium Chloride Solution, 18%

General information

Notes on storage conditions and product stability

Polyaluminium chloride solutions are stable indefinitely when stored under benign conditions (sealed vessel, constant temperature). However, some users may experience product instability, which can arise from two potential problems:

1)The product is designed to break down on contact with water, to allow water treatment to occur. As a result, water vapour condensing on inside tank surfaces may lead to colourless crystals forming when the water drops back into the bulk liquid. These crystals can only be dissolved using hot water. Condensation should thus be minimised by tank design and location. If possible, avoid tanks that are dark in colour, in direct sunlight, and off the ground, as these factors will lead to large day/night temperature fluctuations.

2) Long-term storage in open/vented vessels may result in evaporation of water, leading to over concentration of the PAC, and formation of a very fine, cream-coloured deposit. This deposit is easily dissolved in cold water.

Industrial Chemicals Limited thus recommends that tanks be designed to minimise temperature effects, have a top hatch to allow routine quarterly inspection for any deposits, and have a bottom drain in case the need for washout occurs. In addition, when switching from the use of another water treatment chemical to PAC, the user is strongly recommended to wash out the tanks and dosing system to remove any incompatible materials before the PAC is unloaded. Some sedimentation can occur in this product. Even after filtering, slow sedimentation will occur. To avoid problems caused by this sedimentation, storage tanks should be cleaned every 1 to 2 years.

Revision comments Updated Section(s) 14,

Issued by D.Kelly

Revision date 04/10/2017

Revision 4

Supersedes date 20/08/2013

Risk phrases in full R34 Causes burns.

Hazard statements in full H290 May be corrosive to metals.
H318 Causes serious eye damage.

Taytech
environmental solutions

Safety Data Sheet
TT-OG

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY

PRODUCT NAME:	**TT-OG**
PART No:	
APPLICATIONS:	**Hydrogen Sulphide Scavenger**
SUPPLIER:	**Taytech**
	47 Ardrossan Road, Seamill,
	West Kilbride, Ayrshire,
	Scotland, KA23 9 NE
TEL:	**07980 606952**
FAX:	**07977 103059**

2 COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME (class)	CAS No.	CONTENTS	HEALTH	RISK (R No.)
Stabilized Chlorine Dioxide		10-30%	C	20/21/22,31,34

3 HAZARDS IDENTIFICATION

Harmful by inhalation, in contact with skin and if swallowed. Causes burns.

4 FIRST AID MEASURES

INHALATION: Move the exposed person to fresh air at once. Get medical attention IMMEDIATELY!

INGESTION: DO NOT INDUCE VOMITING! NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Promptly get affected personnel to drink large volumes of water to dilute the swallowed chemical. Get medical attention if any discomfort continues.

SKIN: Remove affected person from source of contamination. Wash off promptly and flush contaminated skin with water. Promptly remove clothing if soaked through and flush skin with water. Get medical attention if irritation persists after washing.

EYES: Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention immediately. Continue to rinse.

5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Foam, dry chemical, C02 & water fog/spray

SPECIAL FIRE FIGHTING PROCEDURES: Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion may liberate toxic chlorine dioxide gas. Risk of explosion

PROTECTIVE MEASURES IN FIRE: Fire personnel exposed to gases from the product should use respiratory protection. Avoid skin contact/inhalation of dust/vapour. Wear appropriate protective clothing.

6 ACCIDENTAL RELEASE MEASURES

SPILL CLEAN UP METHODS:

- EVACUATE ALL NON-ESSENTIAL PERSONNEL. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate.
- PERSONAL PROTECTION. Avoid contact with skin or inhalation of spillage, dust or vapour. Wear necessary protective equipment.
- ABSORB. Absorb in vermiculite, dry sand or earth and place into containers.
- FLUSH/DILUTE. Wash thoroughly after dealing with a spillage. Recover waste water for disposal. Runoff or release to sewer, waterway or ground is forbidden.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS: Avoid acids, moisture, and combustible materials. Do not use in confined spaces without adequate ventilation and/or respirator. Eye wash facilities and emergency shower must be available when handling this product. Provide self-contained breathing apparatus nearby.

STORAGE PRECAUTIONS: Store at temperature below 50°C. Protect from light Do not let any spilt product become dry - risk of flammability and explosive decomposition. Do not store on or beside flammable materials. Use container made of: Polyethylene, PVC, polyester, stainless steel or protected glass. Do NOT use container made of: copper, copper alloys, ordinary steel

8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

INGREDIENT COMMENTS: Chlorine dioxide LT Exposure (8h TWA) 0.1ppm

ST exposure (15 minutes) 0.3ppm

EYE PROTECTION: Gloves, Canister Mask, Visor

HYGIENIC WORK ROUTINES: Provide sufficient ventilation during operations which cause vapour formation. If ventilation is insufficient suitable respiratory protection must be provided. Wear full face mask supplied with gas cartridge (chlorine dioxide)

Chemical resistant gloves required for prolonged or repeated contact. Use protective gloves made of Neoprene Avoid any gloves or clothing made of: Leather, cotton Rubber (natural latex).
Wear full face visor or shield.
Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station . Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. Use appropriate skin cream to prevent drying of skin. No eating or drinking while working with this material. DO NOT SMOKE IN WORK AREA!

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Liquid	**COLOUR:**	Light Yellow
ODOUR/TASTE:	Mild faint smell of chlorine	**BOILING POINT (°C):**	103
SOLUBILITY:	Soluble in Water	**SPECIFIC GRAVITY (Water=1):**	1.19 @ 20°C
MELTING POINT (°C):	< -0.5	**FLASH POINT (°C):**	>100
pH VALUE, CONC:	9.0 – 10.5		

10 STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Avoid contact with strong reducing agents & strong acids. Temperatures above 50 degrees. Light.

MATERIALS TO AVOID: Reducing agents, organic materials, oils

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of: Chlorine. Carbon.

11 TOXICOLOGICAL INFORMATION

INHALATION: Gas or vapour may irritate respiratory system. High concentrations may cause severe lung damage.

INGESTION: Harmful if swallowed. May cause severe internal injury.

SKIN: Causes burns.

EYES: Extreme irritation of eyes and mucous membranes, including burning and tearing.

11.1 Information on toxicological effects

Oral Rat LD50 > 250mg/kg

12 ECOLOGICAL INFORMATION

BIO ACCUMULATION: No bioaccumulation expected

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: Dispose of in accordance with Local Authority requirements.

14 TRANSPORT INFORMATION

LABEL FOR CONVEYANCE:

HAZARD CLASS (ADR): Class 8: Corrosive Substance

HAZCHEM CODE 2X

SHIPPING NAME: Chlorine Dioxide Solution

15 REGULATORY INFORMATION

LABEL FOR SUPPLY:

SIGNAL WORD**:**
DANGER

HAZARD STATEMENTS

H270 - May intensify fire; oxidiser.
H302 - Harmful if swallowed.
H318 - Causes serious eye damage.
H410 - Very toxic to aquatic life with long lasting effects.
H372 - May cause damage to organs through prolonged or repeated exposure if swallowed.
EUH032 - Contact with acids liberates very toxic gas.

PRECAUTIONARY STATEMENTS

P210 - Keep away from heat.
P362 - Take off any contaminated clothing.
P305 P351 P338 - In case of contact with eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P282 - Wear suitable protective clothing, gloves and eye/face protection.
P302 P252 - After contact with skin, wash immediately with plenty of water.
P412 - Store below 50°C.
P420 - Do not store on or beside flammable materials.

EC DIRECTIVES:	System of specific information relating to Dangerous Preparations 91/155
APPROVED CODE OF PRACTICE:	Classification and Labeling of Substances and Preparations Dangerous for Supply
GUIDANCE NOTES:	Occupational Exposure Limits EH40
	Introduction to Local Exhaust Ventilation HS(G)37
	CLP European Regulation (EC) No 1272/2008

16 OTHER INFORMATION

USER NOTES: INFORMATION	LW
SOURCES: REVISION COMMENTS:	Dangerous Properties of Industrial Materials Report, N.Sax et.al.
REVISION DATE: SIGNATURE:	Seventh Revision
	08/11/2016
	M Taylor

Taytech
environmental solutions

Safety Data Sheet
TT-OX

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY

PRODUCT NAME:	**TT-OX**
PART No:	**1356**
APPLICATIONS:	**Hydrogen Sulphide Scavenger**
SUPPLIER:	**Taytech**
	47 Ardrossan Road, Seamill,
	West Kilbride, Ayrshire,
	Scotland, KA23 9 NE
TEL:	**07980 606952**
FAX:	**01294 835079**

2 HAZARDS IDENTIFICATION

Classification

Corr.to metals	H290 May be corrosive to metals
Acute Tox. 4	H302 Harmful if swallowed
Eye Dam. 1	H318 Causes serious eye damage
STOT RE 2	H373 May cause damage to organs through prolonged or repeated exposure.(Spleen)
Aquatic Acute 1	H400 Very toxic to aquatic life
Aquatic Chronic 3	H412 Harmful to aquatic life with long lasting effects

EUH032: Contact with acids liberates very toxic gas.

Label Elements

GHS05 GHS07 GHS08 GHS09

Signal word *Danger*

Hazard statements
H290 : May be corrosive to metals
H302 Harmful if swallowed.
H318 Causes serious eye damage.
H373 May cause damage to the spleen through prolonged or repeated exposure. Route of exposure: Oral.
H410 : Very toxic to aquatic life with long lasting effects
EUH032 Contact with acids liberates very toxic gas.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P221 Take any precaution to avoid mixing with combustibles.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.

3 COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME (class)	CAS No.	CONTENTS	EC Number
Stabilized Chlorine Dioxide	7758-19-2	≤25%	231-836-6

Registration number	Classification according to Regulation (EU) 1272/2008 (CLP)	Concentration (% w/w)
Sodium chlorite (CAS-No.7758-19-2) (EC-No.231-836-6) (M-Factor : 1[Acute])		
01-2119529240-51	Acute Tox. 3; H301 Acute Tox. 2; H310 Skin Corr. 1B; H314 Ox. Sol. 1; H271 STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 3; H412	24,5 – 25,5 % w/w

4 FIRST AID MEASURES

INHALATION: Move the exposed person to fresh air at once. If not breathing, give artificial respiration. Call a poison control center or doctor for treatment advice.

INGESTION: DO NOT INDUCE VOMITING! NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Call a poison control center or doctor for treatment advice.

SKIN: Remove affected person from source of contamination. Promptly remove clothing if soaked through and flush skin with water. Call a poison control center for treatment advice.

EYES: Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention immediately. Continue to rinse.

5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Foam, sand, dry powder & water fog/spray

EXTINGUISHING MEDIA NOT TO BE USED: Carbon Dioxide (CO_2)

SPECIAL FIRE FIGHTING PROCEDURES: Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion may liberate acrid fumes, sodium oxides.

PROTECTIVE MEASURES IN FIRE: Fire personnel exposed to gases from the product should use respiratory protection. Avoid skin contact/inhalation of dust/vapour. Wear appropriate protective clothing.

6 ACCIDENTAL RELEASE MEASURES

SPILL CLEAN UP METHODS:

- EVACUATE ALL NON-ESSENTIAL PERSONNEL. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate.
- PERSONAL PROTECTION. Avoid contact with skin or inhalation of spillage, dust or vapour. Wear necessary protective equipment.
- ABSORB. Absorb in vermiculite, dry sand or earth and place into containers.
- FLUSH/DILUTE. Wash thoroughly after dealing with a spillage. Recover waste water for disposal. Runoff or release to sewer, waterway or ground is forbidden.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS: Avoid acids, moisture, and combustible materials. Do not use in confined spaces without adequate ventilation and/or respirator. Eye wash facilities and emergency shower must be available when handling this product. Provide self-contained breathing apparatus nearby.

STORAGE PRECAUTIONS: Store at temperature below 50^{o}C. Protect from light Do not let any spilt product become dry - risk of flammability and explosive decomposition. Do not store on or beside flammable materials. Use container made of: Polyethylene, PVC, polyester, stainless steel or protected glass. Do NOT use container made of: copper, copper alloys, ordinary steel. Keep away from strong acids and oxidizing agents.

8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

Derived No Effect Level (DNEL)

: Type of Application (Use): Workers
Exposure routes: Skin contact
Health Effect: Acute - systemic effects
Value: 0.58 mg/kg body weight (bw) /day

: Type of Application (Use): Workers

Exposure routes: Skin contact
Health Effect: Long-term - systemic effects
Value: 0.58 mg/kg body weight (bw) /day

: Type of Application (Use): Workers
Exposure routes: Inhalation
Health Effect: Acute - systemic effects
Value: 0.41 mg/m3

: Type of Application (Use): Workers
Exposure routes: Inhalation
Health Effect: Long-term - systemic effects
Value: 0.41 mg/m3

: Type of Application (Use): Consumers
Exposure routes: Skin contact
Health Effect: Acute - systemic effects
Value: 0.29 mg/kg body weight (bw) /day

: Type of Application (Use): Consumers
Exposure routes: Inhalation
Health Effect: Acute - systemic effects
Value: 0.1 mg/m3

: Type of Application (Use): Consumers
Exposure routes: Skin contact
Health Effect: Long-term - systemic effects
Value: 0.29 mg/kg body weight (bw) /day

: Type of Application (Use): Consumers
Exposure routes: Inhalation
Health Effect: Long-term - systemic effects
Value: 0.1 mg/m3

: Type of Application (Use): Consumers
Exposure routes: Ingestion
Health Effect: Long-term - systemic effects
Value: 0.029 mg/kg body weight (bw) /day

: Type of Application (Use): Consumers
Exposure routes: Ingestion
Health Effect: Acute - systemic effects
Value: 0.029 mg/kg body weight (bw) /day

Predicted No Effect Concentration (PNEC)

Value: 0.00065 mg/l
Compartment: Fresh water

: Value: 0.000065 mg/l
Compartment: Marine water

: Value: 0.0065 mg/l
Compartment: Intermittent use/release

: Value: 1 mg/l
Compartment: Sewage treatment plants

ENGINEERING MEASURES: Ensure adequate ventilation, especially in confined areas**.**

EYE PROTECTION: Wear chemical splash goggles. Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

HAND PROTECTION: Impervious gloves
:Material: Neoprene gloves
:Material: Polyvinyl chloride - PVC

HYGIENIC WORK ROUTINES: Provide sufficient ventilation during operations which cause vapour formation. If ventilation is insufficient suitable respiratory protection must be provided. Wear full face mask supplied with gas cartridge (chlorine dioxide)

Chemical resistant gloves required for prolonged or repeated contact. Use protective gloves

made of Neoprene Avoid any gloves or clothing made of: Leather, cotton Rubber (natural latex).

Wear full face visor or shield.

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station . Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. Use appropriate skin cream to prevent drying of skin. No eating or drinking while working with this material. DO NOT SMOKE IN WORK AREA!

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Liquid	**COLOUR:**	Light Yellow
ODOUR/TASTE:	Odorless, slight chlorine	**BOILING POINT (^{o}C):**	106
SOLUBILITY:	Soluble in Water	**DENSITY**	1205-1225 g/L @15^{o}C
pH VALUE, CONC:	>12	**FLASH POINT (^{o}C):**	Does not flash
OXIDISING PROPERTIES:	Not Classified as Oxidizing.		

10 STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Stable under normal conditions. Decomposes on heating.

MATERIALS TO AVOID: Strong acids and oxidizing agents, reducing agents, organic materials, chlorinated compounds

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of: Chlorine, Chlorine, Oxygen, Acrid fumes, Sodium Oxides

11 TOXICOLOGICAL INFORMATION

INHALATION: Gas or vapour may irritate respiratory system. High concentrations may cause severe lung damage.

INGESTION: Harmful if swallowed. May cause severe internal injury. Nausea, Pain, Weakness, Vomiting.

SKIN: Discomfort, Irritation, Itching, Redness

EYES: Excessive lachrymation, Damage

12 ECOLOGICAL INFORMATION

BIO ACCUMULATION: No bioaccumulation expected

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: Dispose of as hazardous waste in accordance with Local and National Authority requirements.

14 TRANSPORT INFORMATION

LABEL FOR CONVEYANCE:

HAZARD CLASS (ADR): Class 8: Corrosive Substance
HAZCHEM CODE 2X
SHIPPING NAME: Chlorine Dioxide Solution

15 REGULATORY INFORMATION

LABEL FOR SUPPLY:

SIGNAL WORD**:**

DANGER

HAZARD STATEMENTS

H290 - May be corrosive to metals
H302 - Harmful if swallowed.
H318 - Causes serious eye damage.
H410 - Very toxic to aquatic life with long lasting effects.
H373 - May cause damage to organs through prolonged or repeated exposure if swallowed. (spleen)
EUH032 - Contact with acids liberates very toxic gas.

PRECAUTIONARY STATEMENTS

P210 - Keep away from heat.
P221 - Take any precaution to avoid mixing with combustibles.
P305 P351 P338 - In case of contact with eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P260 – Do not breathe dust/fume/gas/mist/vapours/spray.
P273 – Avoid release to the environment.
P280 – Wear protective gloves/protective clothing/eye protection/face protection.
P310 – Immediately call a POISON CENTER or doctor/physician.

EC DIRECTIVES:	System of specific information relating to Dangerous Preparations 91/155
APPROVED CODE OF PRACTICE:	Classification and Labeling of Substances and Preparations Dangerous for Supply
GUIDANCE NOTES:	Occupational Exposure Limits EH40
	Introduction to Local Exhaust Ventilation HS(G)37
	CLP European Regulation (EC) No 1272/2008

16 ADDITIONAL INFORMATION

Full text of H-Statements referred to under section 2

HAZARD STATEMENTS

H271- May cause fire and explosion; strong oxidiser
H301- Toxic if swallowed
H310- Fatal in contact with skin.
H314- Causes severe skin burns and eye damage
H373- Maycause damage to organs through prolonged or repeated exposure.
H400- Very Harmful to aquatic life.
H412- Harmful to aquatic life with long lasting effects.

USER NOTES: INFORMATION SOURCES: REVISION COMMENTS: REVISION DATE: SIGNATURE:

LW
Dangerous Properties of Industrial Materials Report, N.Sax et.al.
Sixth Revision
1/05/2015
M Taylor

SAFETY DATA SHEET

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

1.1. Product identifier

Name of the substance	Diesel Fuels and Gas Oils - All Grades (Refer to Synonyms for Product Name)
Identification number	649-224-00-6 (Index number)
Registration number	01-2119484664-27-0052
Synonyms	Ultra Low Sulphur Diesel, FAME Free * Ultra Low Sulphur Diesel, up to 7% FAME * Ultra Low Sulphur Gas Oil , Unmarked - FAME Free * Ultra Low Sulphur Gasoil, Unmarked, up to 7% FAME * High Sulphur Diesel * GTL Diesel * Unfinished Diesel
SDS number	2004
Issue date	10-January-2020
Version number	03
Revision date	04-March-2020
Supersedes date	07-February-2020

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

Identified uses	Use as a fuel. A complete list of registered uses for this product can be found in the table of content of the exposure scenario for communication, available as an annex to the eSDS.
Uses advised against	All other uses.

1.3. Details of the supplier of the safety data sheet

Supplier

Company name	Valero Energy Ltd
Address	1 Canada Square, London E14 5AA. United Kingdom
Telephone	01/210 345 4593 (General information; US)
e-mail	CorpHSE@valero.com
Contact person	Industrial Hygienist

1.4. Emergency telephone number 0044/(0)18 65 407333

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards		
Flammable liquids	Category 3	H226 - Flammable liquid and vapour.
Health hazards		
Acute toxicity, inhalation	Category 4	H332 - Harmful if inhaled.
Skin corrosion/irritation	Category 2	H315 - Causes skin irritation.
Carcinogenicity	Category 2	H351 - Suspected of causing cancer.
Specific target organ toxicity - repeated exposure	Category 2 (thymus, liver, bone marrow)	H373 - May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure.
Aspiration hazard	Category 1	H304 - May be fatal if swallowed and enters airways.
Environmental hazards		
Hazardous to the aquatic environment, long-term aquatic hazard	Category 2	H411 - Toxic to aquatic life with long lasting effects.

Hazard summary May be ignited by heat, sparks or flames. May be fatal if swallowed and enters airways. Harmful if inhaled. May cause damage to organs through prolonged or repeated exposure. Suspected of causing cancer. Causes skin irritation. Dangerous for the environment if discharged into watercourses.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Fuels, diesel

Hazard pictograms

Signal word Danger

Hazard statements

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H351	Suspected of causing cancer.
H373	May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe mist/vapours.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response

P301 + P310	IF SWALLOWED: Immediately call a POISON CENTRE/doctor.
P331	Do NOT induce vomiting.

Storage Not assigned.

Disposal Not assigned.

Supplemental label information None.

2.3. Other hazards Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. Hydrogen sulphide (H2S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Fuels, diesel	100	68334-30-5 269-822-7	01-2119484664-27-0052	649-224-00-6	
Classification:	Flam. Liq. 3;H226, Asp. Tox. 1;H304, Skin Irrit. 2;H315, Acute Tox. 4;H332, Carc. 2;H351, STOT RE 2;H373, Aquatic Chronic 2;H411				N

Composition comments This product is registered under the REACH Regulation 1907/2006 as a UVCB. All concentrations are in percent by weight unless ingredient is a gas.
Hydrogen sulphide (H2S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations. The full text for all H-statements is displayed in section 16.

Note N: The classification as a carcinogen need not apply if the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen. This note applies only to certain complex oil-derived substances in Part 3.

SECTION 4: First aid measures

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

4.1. Description of first aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Call a poison centre or doctor/physician if you feel unwell.

Skin contact Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.
Ingestion	Call a physician or poison control centre immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
4.2. Most important symptoms and effects, both acute and delayed	Aspiration may cause pulmonary oedema and pneumonitis. Direct contact with eyes may cause temporary irritation. Skin irritation. May cause redness and pain. Jaundice. Prolonged exposure may cause chronic effects.
4.3. Indication of any immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards	Flammable liquid and vapour.
5.1. Extinguishing media	
Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
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	Thermal decomposition may produce smoke, oxides of carbon and lower molecular weight organic compounds whose composition have not been characterised. Sulphur oxides. Nitrogen Oxides (NOx). Vapours may form explosive mixtures with air. Vapours may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.
5.3. Advice for firefighters	
Special protective equipment for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Special fire fighting procedures	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist/vapours. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.
For emergency responders	Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Use personal protection recommended in Section 8 of the SDS.
6.2. Environmental precautions	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
6.3. Methods and material for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil etc) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. The product is immiscible with water and will spread on the water surface. Prevent entry into waterways, sewer, basements or confined areas. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers.
6.4. Reference to other sections	For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability. (Subject to applicability) If sulphur compounds are suspected to be present in the product, check the atmosphere for H2S content. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not breathe mist/vapours. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see section 10 of the SDS).

7.3. Specific end use(s)

For detailed information, see section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures

Follow standard monitoring procedures.

Derived no effect levels (DNELs)

General Population

Product	Value	Assessment factor	Notes
Diesel Fuels and Gas Oils - All Grades (Refer to Synonyms for Product Name) (CAS 68334-30-5)			
Long-term, Systemic, Dermal	1.3 mg/kg bw/day		
Long-term, Systemic, Inhalation	20 mg/m3		
Long-term, Systemic, Oral	1.3 mg/kg bw/day		
Short-term, Systemic, Inhalation	2600 mg/m3		

Workers

Product	Value	Assessment factor	Notes
Diesel Fuels and Gas Oils - All Grades (Refer to Synonyms for Product Name) (CAS 68334-30-5)			
Long-term, Systemic, Dermal	2.9 mg/kg bw/day		
Long-term, Systemic, Inhalation	68.3 mg/m3		
Short-term, Systemic, Inhalation	4300 mg/m3		

Predicted no effect concentrations (PNECs)

Not available.

8.2. Exposure controls

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

General information

Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye/face protection

Wear safety glasses with side shields (or goggles). Eye protection should meet standard EN 166.

Skin protection

- Hand protection

Wear suitable gloves tested to EN374. In full contact: Glove material: Nitrile rubber. Layer thickness: 0.225 mm. Breakthrough time: >480 min. Splash contact: Glove material: Neoprene; Layer thickness: 0.75 mm; Breakthrough time: 10-30 min.

- Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

In case of inadequate ventilation or risk of inhalation of oil mist, suitable respiratory equipment with combination filter (type A2/P2) can be used.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

Hygiene measures	Observe any medical surveillance requirements. When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Liquid.
Colour	Colourless to green/brown.
Odour	Petroleum.
Odour threshold	Not available.
pH	Not applicable.
Melting point/freezing point	Not applicable.
Initial boiling point and boiling range	160 - 400 °C (320 - 752 °F)
Flash point	> 56.0 °C (> 132.8 °F)
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	0.4 kPa (40°C)
Vapour density	Not applicable.
Relative density	0.8 - 0.91 g/cm3
Solubility(ies)	Insoluble in water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	>= 225 °C (>= 437 °F)
Decomposition temperature	Not available.
Viscosity	>= 1.5 mm²/s (50°C)
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

9.2. Other information

Density	0.80 - 0.91 g/cm³

SECTION 10: Stability and reactivity

10.1. Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
10.2. Chemical stability	Material is stable under normal conditions.
10.3. Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
10.4. Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
10.5. Incompatible materials	Strong oxidising agents.
10.6. Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11: Toxicological information

General information	Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation	Harmful if inhaled.
Skin contact	Causes skin irritation.

Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
Symptoms	Aspiration may cause pulmonary oedema and pneumonitis. Skin irritation. May cause redness and pain. Jaundice.

11.1. Information on toxicological effects

Acute toxicity	May be fatal if swallowed and enters airways. Harmful if inhaled. Hydrogen sulphide, a highly toxic gas, may be present. Signs and symptoms of overexposure to hydrogen sulphide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odour does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.

Product	Species	Test Results
Fuels, diesel (CAS 68334-30-5)		
Acute		
Dermal		
LD50	Rabbit	> 4300 mg/kg
Inhalation		
Vapor/aerosol		
LC50	Rat	4.1 mg/l, 4 Hours
Oral		
LD50	Rat	> 5000 mg/kg

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory sensitisation	Based on available data, the classification criteria are not met.
Skin sensitisation	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	Suspected of causing cancer.
Reproductive toxicity	Based on available data, the classification criteria are not met.
Specific target organ toxicity - single exposure	Based on available data, the classification criteria are not met.
Specific target organ toxicity - repeated exposure	May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure.
Aspiration hazard	May be fatal if swallowed and enters airways.
Mixture versus substance information	No information available.
Other information	May be absorbed through the skin.

SECTION 12: Ecological information

12.1. Toxicity Toxic to aquatic life with long lasting effects.

Product		Species	Test Results
Fuels, diesel (CAS 68334-30-5)			
Aquatic			
Acute			
Algae	ErL50	Algae	22 mg/l
Crustacea	EL50	Daphnia	68 mg/l
Fish	LL50	Fish	21 mg/l

12.2. Persistence and degradability	Expected to be inherently biodegradable.
12.3. Bioaccumulative potential	The product is not bioaccumulating.
Partition coefficient n-octanol/water (log Kow)	Not available.
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	No data available.
12.5. Results of PBT and vPvB assessment	This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.

12.6. Other adverse effects Oil spills are generally hazardous to the environment. The product contains volatile organic compounds which have a photochemical ozone creation potential.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

EU waste code 13 07 01*
The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Disposal methods/information Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Special precautions Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. UN number UN1202
14.2. UN proper shipping name DIESEL FUEL
14.3. Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) 3
Hazard No. (ADR) 30
Tunnel restriction code D/E
14.4. Packing group III
14.5. Environmental hazards Yes
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

RID

14.1. UN number UN1202
14.2. UN proper shipping name DIESEL FUEL
14.3. Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) 3
14.4. Packing group III
14.5. Environmental hazards Yes
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

ADN

14.1. UN number UN1202
14.2. UN proper shipping name DIESEL FUEL
14.3. Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) 3
14.4. Packing group III
14.5. Environmental hazards Yes
14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IATA

14.1. UN number UN1202
14.2. UN proper shipping name DIESEL FUEL
14.3. Transport hazard class(es)
Class 3
Subsidiary risk -

14.4. Packing group	III
14.5. Environmental hazards	Yes
ERG Code	3L
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

14.1. UN number	UN1202
14.2. UN proper shipping name	DIESEL FUEL
14.3. Transport hazard class(es)	
Class	3
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	
Marine pollutant	Yes
EmS	F-E, S-E
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.
General information	Shipping descriptions in this section are offered as examples only. Classification for transport must accurately reflect the material hazards as designated under a variety of regulations and is solely the responsibility of the person offering the material into transport for commerce.

SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Fuels, diesel (CAS 68334-30-5)

Other regulations	The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended. Directive 2012/18/EU on major accident hazards involving dangerous substances: Part 2 (Named dangerous substances) - 34. Petroleum products and alternative fuels.
National regulations	According to Directive 92/85/EEC as amended, pregnant women should not work with the product, if there is the least risk of exposure. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended. Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.
15.2. Chemical safety assessment	Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations	DNEL: Derived No-Effect Level. PNEC: Predicted No-Effect Concentration. PBT: Persistent, bioaccumulative and toxic. vPvB: Very Persistent and very Bioaccumulative.
References	Chemical safety report. CONCAWE ECHA: European Chemical Agency.
Information on evaluation method leading to the classification of mixture	Not applicable.
Full text of any H-statements not written out in full under Sections 2 to 15	H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H332 Harmful if inhaled. H351 Suspected of causing cancer. H373 May cause damage to organs through prolonged or repeated exposure. H411 Toxic to aquatic life with long lasting effects.
Training information	Follow training instructions when handling this material.
Disclaimer	This material Safety Data Sheet (SDS) was prepared in accordance with EC No 1272/2008 by Valero Energy Ltd. Valero Energy Ltd. does not assume any liability arising out of product use by others. The information, recommendations, and suggestions presented in this SDS are based upon test results and data believed to be reliable. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all the scientific and study information in the format of this document, plus additional information may be necessary under exceptional conditions of use, or because of applicable laws or government regulations.

Annex to the extended Safety Data Sheet (eSDS)

Table of contents

1 - Exposure Scenario Worker

1. Manufacture of substance

List of use descriptors

Sector(s) of Use	Manufacture of substance
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of the substance
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC15: Use as laboratory reagent

2.1.1. Contributing scenario controlling environmental exposure for Manufacture of the substance

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage	26000000 tonnes/year
Fraction of regional tonnage used locally	0.75
Annual site tonnage	19000000 tonnes/year
Maximum daily site tonnage	64000000 kg/day

Frequency and duration of use

Continuous process	300 days/year

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days		Emission factors		
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0.0059	0.0001	0.00000041	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Treat air emission to provide a typical removal efficiency of (%): 90
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 94.4. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0.
Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant

Discharge rate	10000 m3/day
Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 6.5e7 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	During manufacturing no waste of the substance is generated.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	During manufacturing no waste of the substance is generated.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): Handle substance within a closed system. Bulk closed loading and unloading: Handle substance within a closed system. Bulk product storage: Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Process sampling: No other specific measures identified. Laboratory activities: No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.

Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. General exposures (open systems): Wear suitable gloves tested to EN374. Bulk closed loading and unloading: Wear suitable gloves tested to EN374. Bulk open loading and unloading: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

2 - Exposure Scenario Worker

1. Formulation & (re)packing of substances and mixtures

List of use descriptors

Sector(s) of Use	SU10: Formulation [mixing] of preparations and/or re-packaging
Name of contributing environmental scenario and corresponding ERC	ERC2: Formulation into mixture
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC14: Tabletting, compression, extrusion, pelettisation, granulation PROC15: Use as laboratory reagent

2.1.1. Contributing scenario controlling environmental exposure for Formulation into mixture

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	30000000 tonnes/year
Fraction of regional tonnage used locally	0.001
Annual site tonnage	30000 tonnes/year
Maximum daily site tonnage	100000 kg/day

Frequency and duration of use

Continuous process	300 days/year

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days		Emission factors		
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0.01	0.0001	0.00005	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Treat air emission to provide a typical removal efficiency of (%): 0
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 94.1. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0.
Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	20000 m³/day
Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 1.1e5 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): Handle substance within a closed system. Storage: Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Batch processes at elevated temperatures: Provide extract ventilation to points where emissions occur. Drum/batch transfers: Use drum pumps or carefully pour from container. Bulk transfers: Handle substance within a closed system. Mixing operations (open systems): Provide extract ventilation to points where emissions occur. Laboratory activities: No other specific measures identified. Process sampling: No other specific measures identified.

Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.
Conditions and measures related to personal protection, hygiene and health evaluations	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. General exposures (open systems): Wear suitable gloves tested to EN374. Drum/batch transfers: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Bulk transfers: Wear suitable gloves tested to EN374. Production of preparations or articles by tabletting, compression, extrusion, pelettisation: Wear suitable gloves tested to EN374. Drum and small package filling: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Mixing operations (open systems): Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

3 - Exposure Scenario Worker

1. Use as an intermediate

List of use descriptors

Sector(s) of Use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Name of contributing environmental scenario and corresponding ERC	ERC6a: Use of intermediate
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC15: Use as laboratory reagent

2.1.1. Contributing scenario controlling environmental exposure for Use of intermediate

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	1000000 tonnes/year
Fraction of regional tonnage used locally	0.015
Annual site tonnage	15000 tonnes/year
Maximum daily site tonnage	50000 kg/day

Frequency and duration of use

Continuous process	300 days/year

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other factors	Estimated substance removal from wastewater via domestic sewage treatment (%): 94.9

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0.001	0.001	0.000099	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Treat air emission to provide a typical removal efficiency of (%): 80
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 94.1. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0.
Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	2000 m³/day
Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 5.4e4 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	This substance is consumed during use and no waste of the substance is generated.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	This substance is consumed during use and no waste of the substance is generated.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): Handle substance within a closed system. Storage: Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities: No other specific measures identified. Bulk closed loading and unloading: Handle substance within a closed system. Process sampling: No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.

Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. General exposures (open systems): Wear suitable gloves tested to EN374. Bulk closed loading and unloading: Wear suitable gloves tested to EN374. Bulk open loading and unloading: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

4 - Exposure Scenario Worker

1. Distribution of substance

List of use descriptors

Sector(s) of Use	Distribution of substance
Name of contributing environmental scenario and corresponding ERC	ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5: Use at industrial site leading to inclusion into/onto article ERC6a: Use of intermediate ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7: Use of functional fluid at industrial site
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent

2.1.1. Contributing scenario controlling environmental exposure for Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	31000000 tonnes/year
Fraction of regional tonnage used locally	0.002
Annual site tonnage	61000 tonnes/year
Maximum daily site tonnage	200000 kg/day

Frequency and duration of use

Continuous process	300 days/year

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days		Emission factors		
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0.001	0.00001	0.00001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Treat air emission to provide a typical removal efficiency of (%): 90
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0

Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	2000 m³/day
Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 3.9e5 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): Handle substance within a closed system. Storage: Handle substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities: No other specific measures identified. Bulk closed loading and unloading: Handle substance within a closed system. Process sampling: No other specific measures identified.

Organizational measures to prevent/limit releases, dispersion and exposure	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.
Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. General exposures (open systems): Wear suitable gloves tested to EN374. Bulk closed loading and unloading: Wear suitable gloves tested to EN374. Bulk open loading and unloading: Wear suitable gloves tested to EN374. Drum and small package filling: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

5 - Exposure Scenario Worker

1. Use in Oil and Gas field drilling and production operations

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Name of contributing environmental scenario and corresponding ERC	ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities

2.1.1. Contributing scenario controlling environmental exposure for Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	1
Regional use tonnage	20000 tonnes/year

Frequency and duration of use

Continuous process	Continuous

Environment factors not influenced by risk management

Local freshwater dilution factor:	Not available.
Local marine water dilution factor:	Not available.

Other given operational conditions affecting environmental exposure

	Emission days		Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
Not applicable.					

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Discharge to aquatic environment is restricted (see section 4.2).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not available.
Soil	Not available.
Water	Not available.
Sediment	Not available.
Organisational measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Municipal Sewage Treatment Plant
Discharge rate	Not available.
Sludge treatment technique	Not available.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations. Cuttings and process water are disposed according to local and/or national regulations.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Remarks	Cuttings and process water are disposed according to local and/or national regulations.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid.
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.

Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): Handle substance within a closed system. Storage: Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers: Transfer via enclosed lines. Drilling mud (re-)formulation: No other specific measures identified. Operation of solids filtering equipment: Provide the operation with a properly sited receiving hood. Cuttings treatment and disposal: Provide extract ventilation to points where emissions occur. Sample collection: No other specific measures identified.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions.

Conditions and measures related to personal protection, hygiene and health evaluations	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Filling / preparation of equipment from drums or containers: Wear suitable gloves tested to EN374. Drill floor operations: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Cleaning of solids filtering equipment: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. General exposures (open systems): Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Pouring from small containers: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment. Qualitative approach used to conclude safe use.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Offshore drilling: Discharge to aquatic environment is restricted by law and industry prohibits release. OSPAR Commission 2009. Discharges, Spills, and Emissions from Offshore Oil and Gas Installations in 2007, including the assessment of data reported in 2006 and 2007.

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

1. Use as a fuel, Industrial

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Name of contributing environmental scenario and corresponding ERC	ERC7: Use of functional fluid at industrial site
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC16: Use of fuels

2.1.1. Contributing scenario controlling environmental exposure for Use of functional fluid at industrial site

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	3700000 tonnes/year
Fraction of regional tonnage used locally	0.4
Annual site tonnage	1500000 tonnes/year
Maximum daily site tonnage	5000000 kg/day

Frequency and duration of use

Continuous process	Emission days (days/year): 100

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0.005	0	0.000001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Treat air emission to provide a typical removal efficiency of (%): 95
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 94.3. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0.
Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	2000 m³/day

Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 5.2e6 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	This substance is consumed during use and no waste of the substance is generated.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Use as a fuel (closed systems): No other specific measures identified. Storage: Handle substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Not available.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.

Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Bulk transfers: Wear suitable gloves tested to EN374. Drum/batch transfers: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

7 - Exposure Scenario Worker

1. Functional Fluids, Industrial.

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Name of contributing environmental scenario and corresponding ERC	ERC7: Use of functional fluid at industrial site
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2.1.1. Contributing scenario controlling environmental exposure for Use of functional fluid at industrial site

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	1400 tonnes/year
Fraction of regional tonnage used locally	0.0069
Annual site tonnage	10 tonnes/year
Maximum daily site tonnage	500 kg/day

Frequency and duration of use

Continuous process	Emission days (days/year): 20

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	20	0.005	0.001	0.00003	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Treat air emission to provide a typical removal efficiency of (%): 0
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 36.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	2000 m³/day
Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 9.7e2 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Filling of articles/equipment (closed systems): Transfer via enclosed lines. Equipment operation (closed systems): No other specific measures identified. Storage: Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers: No other specific measures identified. Equipment operations (open systems): Restrict area of openings and provide extract ventilation to emission points when substance handed at elevated temperatures.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

Conditions and measures related to personal protection, hygiene and health evaluations	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Drum/batch transfers: Wear suitable gloves tested to EN374. Re-work and re-manufacture of articles: Wear suitable gloves tested to EN374. Filling / preparation of equipment from drums or containers: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

8 - Exposure Scenario Worker

1. Use as a fuel, Professional

List of use descriptors

Sector(s) of Use	SU22: Professional uses
Name of contributing environmental scenario and corresponding ERC	ERC9a: Widespread use of functional fluid (indoor) ERC9b: Widespread use of functional fluid (outdoor)
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC16: Use of fuels

2.1.1. Contributing scenario controlling environmental exposure for Widespread use of functional fluid (indoor)

Product characteristics

Physical state	Liquid. Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	6800000 tonnes/year
Fraction of regional tonnage used locally	0.0005
Annual site tonnage	3400 tonnes/year
Maximum daily site tonnage	9300 kg/day

Frequency and duration of use

Continuous process	Emission days (days/year): 365

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	365	0.0001	0.00001	0.00001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Not applicable.
Soil	Not applicable.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 86.9. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not applicable.
Organisational measures to prevent/limit release from site	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	2000 m³/day

Treatment effectiveness	94.5 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 2.2e4 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.5 %

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.
Remarks	Not applicable.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	This substance is consumed during use and no waste of the substance is generated.

2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product characteristics

Physical form of the product	Liquid With potential for aerosol generation
vapour pressure	Liquid, vapour pressure < 0.5 kPa at Standard Temperature and Pressure

Amounts used

Covers percentage substance in the product up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours

Human factors not influenced by risk management

Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

Other relevant operational conditions

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Use as a fuel (closed systems): Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Storage: Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers: Use drum pumps or carefully pour from container.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities: Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. Equipment cleaning and maintenance: Drain down system prior to equipment break-in or maintenance.

Conditions and measures related to personal protection, hygiene and health evaluations	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Bulk transfers: Wear suitable gloves tested to EN374. Drum/batch transfers: Wear suitable gloves tested to EN374. Refuelling: Wear suitable gloves tested to EN374. Equipment cleaning and maintenance: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

9 - Exposure Scenario Consumer

1. Use as a fuel

List of use descriptors

Sector(s) of Use	SU21: Consumer uses
Name of contributing environmental scenario and corresponding ERC	ERC9a: Widespread use of functional fluid (indoor) ERC9b: Widespread use of functional fluid (outdoor)
List of names of contributing consumer scenarios and corresponding PROCs	PC13: Fuels

2.1.1. Contributing scenario controlling environmental exposure for Widespread use of functional fluid (indoor)

Product characteristics

Physical state	Substance is complex UVCB. Predominantly hydrophobic

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage	19000000 tonnes/year
Fraction of regional tonnage used locally	0.0005
Annual site tonnage	9500 tonnes/year
Maximum daily site tonnage	26000 kg/day

Frequency and duration of use

Continuous process	Emission days (days/year): 365

Environment factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0.0001	0.00001	0.00001	

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	Not available.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m3/d)

Type	No wastewater treatment required.
Discharge rate	2000 m³/day
Treatment effectiveness	94.5 %
Sludge treatment technique	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 6.2e4 kg/d

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.
Disposal methods	Not applicable.
Treatment effectiveness	Not available.
Remarks	Not applicable.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations This substance is consumed during use and no waste of the substance is generated.

2.2.1. Contributing exposure scenario controlling consumer exposure for Fuels

Product characteristics

Physical form of the product Liquid.

vapour pressure Liquid, vapour pressure > 10 Pa at Standard Temperature and Pressure

Process temperature Assumes activities are at ambient temperature (unless stated differently).

Amounts used

Liquid: automotive refuelling < 37500 g Covers percentage substance in the product up to 100 %.

Liquid: home space heater fuel < 1500 g Covers percentage substance in the product up to 100 %.

Liquid: garden equipment - use < 750 g Covers percentage substance in the product up to 100 %.

Liquid: garden equipment - refuelling < 750 g Covers percentage substance in the product up to 100 %.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Liquid: automotive refuelling	< 0.05	52 days per year	(Duration unit = hour)
Liquid: scooter refuelling	< 0.03	120 days per year	(Duration unit = hour)
Liquid: garden equipment - use	< 2	26 days per year	(Duration unit = hour)
Liquid: garden equipment - refuelling	< 0.03	26 days per year	(Duration unit = hour)

Human factors not influenced by risk management

Exposed skin areas Liquid: automotive refuelling Covers skin contact area up to 210 cm2
Liquid: home space heater fuel Covers skin contact area up to 210 cm2
Liquid: garden equipment - refuelling Covers skin contact area up to 420 cm2

Other given operational conditions affecting consumer exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks
Liquid: automotive refuelling	100 m³			Outdoor use
Liquid: home space heater fuel	20 m³			Indoor use
Liquid: garden equipment - use	100 m³			Outdoor use
Liquid: garden equipment - refuelling	34 m³			Indoor use

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Conditions and measures related to information and behavioral advice to consumers

Not available.

Conditions and measures related to personal protection, hygiene and health evaluations No specific risk management measure identified beyond those operational conditions stated.

3. Exposure Estimation

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Health

The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these source, then they are indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.