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

1.1 Product identifier

Product name: Gas Oil Class A2, Class D

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

Identified use(s): Fuel.

Uses advised against: Follow supplier's recommendations on correct use of the product. Uses other than those covered by the exposure scenarios included in this safety data sheet are not supported.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Certas Energy UK Limited
302 Bridgewater Place
Birchwood Park
Warrington
Cheshire
WA3 6XG

Telephone: 0800 685 685

E-mail: hse.admin@certasenergy.co.uk

1.4 Emergency telephone number

In case of emergency, call: 01642 679 461 (24 hours, 7 days)

SECTION 2: Hazard Identification

2.1 Classification of the substance or mixture

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

Flam. Liq. 3; H226
Asp Tox 1; H304
Skin Irrit. 2; H315
Acute Tox. 4; H332
Carc. 1B; H350
STOT RE 2; H373 (Thymus, liver, bone marrow)
Aquatic Chronic 2; H411

2.1.2. Classification according to Directive Directive 1999/45/EC (CHIP)

R10
Harmful; Xn; R20
Irritant; Xi; R38
Carc. Cat. 2; R45
Harmful; Xn; R48
Harmful; Xn; R65
Dangerous for the environment; N; R51/53

2.2 Label elements

2.2.1. Label according to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictogram(s):

Signal Word: Danger.

Hazard Statement(s):

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause 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 Statement(s):

P102: Keep out of reach of children.
P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P405: Store locked up.
P501: Dispose of contents/container to approved disposal facility.

Supplemental Hazard information (EU): None.

2.2.2. Label according to Directive 1999/45/EEC (CHIP)

Hazard pictogram(s):

Indications of danger: Harmful, Dangerous for the environment

Hazard Statement(s):

R10: Flammable.
R20: Harmful by inhalation.
R38: Irritating to skin.
R45: May cause cancer.
R48: Danger of serious damage to health by prolonged exposure.
R65: Harmful: may cause lung damage if swallowed.
R51/53: Toxic to aquatic organisms, may cause long-term

adverse effects in the aquatic environment.

Precautionary Statement(s):

S2: Keep out of the reach of children.
S29: Do not empty into drains.
S36/37: Wear suitable protective clothing and gloves.
S61: Avoid release to the environment. Refer to special instructions / safety data sheets.
S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this label or container.

2.3 Other hazards

The product does not meet the criteria for PBT or vPvB substances.

SECTION 3: Composition/Information on Ingredients

3.2 Mixtures

Chemical name	% w/w	CAS No.	EC No.	Index No.	Classification (Regulation (EC) No. 1272/2008 (CLP))	Classification (Directive 67/548/EEC)
Fuels, diesel *REACH: 01-2119484664-27-XXXX*	90-100	68334-30-5	269-822-7	649-224-00-6	Flam. Liq. 3; H226 Asp Tox 1; H304 Skin Irrit. 2; H315 Acute Tox. 4 H332 Carc. 2 H351 STOT RE 2; H373 (Thymus, liver, bone marrow) Aquatic Chronic 2; H411	R10 Xn; R20 Xi; R38 Carc. Cat. 3; R40 Xn; R48 Xn; R65 N; R51/53
Fatty acids, vegetable-oil, Me esters	0-10	68990-52-3	273-606-8	-	-	-
Fatty acids, tallow, Me esters	0-10	61788-61-2	262-989-7	-	-	-
Naphthalene	< 1	91-20-3	202-049-5	601-052-00-2	Acute Tox. 4; H322 Carc. 1B; H350 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	Xn; R22 Carc. Cat. 2; R45 N; R50/53

See Section 16 for full description of R phrases and H statements.

Total sulphur: < 0.1%

SECTION 4: First Aid Measures

4.1 Description of first aid measures

INHALATION: Remove person to fresh air and keep comfortable for breathing. Keep warm and at rest. If symptoms persist, obtain medical attention.

SKIN CONTACT: Remove contaminated clothing immediately. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

EYE CONTACT: Remove contact lenses if present and easy to do. Wash eyes immediately with plenty of water, making sure to rinse under

eyelids. If symptoms persist, obtain medical attention.

INGESTION: Obtain medical attention immediately. Do not induce vomiting. Do not give anything by mouth because of risk of material entering the lungs and causing lung damage. If person is drowsy or unconscious and vomiting, place on left side with head down. If possible, do not leave unattended and observe closely for adequacy of breathing.

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

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of high concentrations of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

May cause cancer. May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatments needed:

In case of accident or if you feel unwell, seek medical advice immediately. If swallowed, patient should be monitored for signs of breathing difficulty as effects of aspiration may be delayed for up to 48 hours. If breathing is laboured, oxygen should be administered by qualified personnel.

SECTION 5: Fire-fighting Measures

5.1 Extinguishing Media

Suitable extinguishing media: Foam, CO2 or dry powder.

Unsuitable extinguishing media: Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapour: Vapour may form explosive mixture with air. Vapour is heavier than air and may accumulate in confined spaces. Vapours may travel considerable distances to ignition sources where they can ignite, flash back or explode. The product will float on surface water and can reignite. Containers exposed to heat may burst due to increase in pressure.

Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

5.3 Advice for fire-fighters

A self-contained breathing apparatus and suitable protective clothing should be worn in fire conditions. Move undamaged containers from fire area if this can be done safely. Keep fire exposed containers cool by spraying with water. Do not allow product or run-off to enter drains, sewers or watercourses.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparkling tools. Use explosion-proof electrical, ventilating and lighting equipment. Caution – spillage area may be slippery.

Keep upwind. Ensure adequate ventilation. Avoid inhalation of vapours. Avoid contact with skin and eyes. Wear suitable personal protective equipment. Wear appropriate respirator when ventilation is inadequate. (See Section 8).

6.1.2 For emergency responders

Keep unnecessary personnel away. Wear suitable protective clothing (See Section 8). Contaminated clothing should be thoroughly cleaned.

6.2 Environmental precautions

Collect spillage. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If spill occurs on water notify the appropriate authorities and advise shipping of any hazard.

6.3 Methods and materials for containment and clearing up

6.3.1 For containment

Stop the leak if it is safe to do so. Contain the spillage with sand, earth or any suitable adsorbent material.

6.3.2 For cleaning up

Use sand, earth or any suitable non-combustible adsorbent material to adsorb spillages. Using non-sparking tools transfer the contaminated absorbent material into a container for disposal.
For spillages on water, remove use appropriate methods such as skimming, booms or adsorbents. For spillages onto soil, remove contaminated soil for remediation or disposal in accordance with local regulations.

Waste containers used should be plastic-lined sealable drums. Containers should be sealed before being disposed of via an authorised waste disposal contractor.

6.3.3 Other advice

None.

6.4 Reference to other sections

See Section 8 for personal protective equipment. See Section 13 for waste disposal.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only non-sparkling tools. Use explosion-proof electrical, ventilating and lighting equipment.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Provide adequate ventilation, including local extraction, to ensure occupational exposure limits are not exceeded. Avoid breathing vapours/spray. Avoid contact with skin and eyes. Wear suitable personal protective equipment (See Section 8).

Do not eat, drink or smoke in the vicinity of the product. Wash thoroughly after handling. Take off contaminated clothing and wash it before reuse. Contaminated clothing should be thoroughly cleaned or disposed of as hazardous waste.

Product transfer
Electrostatic charges may be generated during pumping. Ensure electrical continuity by bonding all equipment. Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care.

Tank cleaning

Cleaning, inspection and maintenance of storage tanks is a specialist operation that requires the implementation of strict procedures and precautions. These include issue of work permits, gas-freeing of tanks, using a manned safety harness, lifelines and wearing air-supplied breathing apparatus. Prior to entry and while cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and explosimeter. Additional precautions are required where the tank may have previously contained leaded gasoline.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Keep away from direct sunlight. Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool. Empty containers retain product residue and can be hazardous.

Keep away from oxidising agents, reducing agents.

This product must never be stored in buildings occupied by people. Drums and small containers should be stored in well-ventilated areas, flameproof cabinets or stores. Keep in a bunded area with a sealed floor to provide containment against spillage. Stack drums to a height not exceeding three metres without the use of racking. Seek specialist advice for the design, construction and operation of bulk storage facilities.

Recommended Storage Container materials

For containers or container linings use mild steel or stainless steel, aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM) which have specifically tested for compatibility with the product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.

Unsuitable Storage Container materials

Synthetic materials such as plastics and fiberglass may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However some may be suitable for glove materials.

7.3 Specific end uses(s)

Refer to supplemental exposure scenarios attached or 'fuel for oil-fired heating systems'.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Workplace exposure limits

Source: EH40/2005, 2nd Ed., 2011.

None assigned.

Community exposure limits

Sources: ILV: 91/322/EEC; IOELV: 2000/39/EC, 2006/15/EC, 2009/161/EU

Substance	Exposure Limit Type	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
			ppm	mg/m³	ppm	mg/m³	
Naphthalene	ILV	91-20-3	10	30	-	-	-

IOELV: Indicative Occupational Exposure Limit Value
ILV: Indicative Limit Value
Skin: Can be absorbed through the skin.

Other exposure limits

Source: American Conference of Governmental Industrial Hygienists (ACGIH)

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m³	ppm	mg/m³	
Fuels, diesel	68334-30-5	-	100	-	-	Skin
Naphthalene	91-20-3	10	-	15	-	Skin, A3

Skin: Can be absorbed through the skin.
A3: Confirmed animal carcinogen with unknown relevance to humans.

Source: Phillips 66 Guidelines

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m³	ppm	mg/m³	
Naphthalene	91-20-3	-	0.2	-	-	As total of 17 PNAs measured by NIOSH method 5506

DNELs (Workers)

Inhalation: 68.3 mg/m^3/day
Dermal: 2.9 mg/kg bw/day

DNELs (Consumers)

Inhalation: 61.2 mg/m^3/day
Dermal: 1.3 mg/kg bw/day

PNECs

None assigned.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation to ensure that occupational exposure limits are not exceeded. Local extraction may be required. Eye wash and quick-drench shower facilities should be available in the work area. Contaminated clothing and shoes should be thoroughly washed before reuse.

8.2.2 Personal protection

Eye protection: Goggles or safety glasses with side shields giving complete protection to eyes. (EN 166). Depending on conditions of use, close-fitting eye protection and a face shield may be necessary.

Skin protection:

Hand protection: Chemical-resistant gloves. (EN 374). Suitable glove material: nitrile, neoprene or PVC (breakthrough time > 240 minutes). Contact glove supplier to confirm suitable glove material, thickness and breakthrough times.

Other: Long sleeve protective clothing. Plastic apron. Rubber boots.

Respiratory protection: Where airborne levels below the exposure limits cannot be maintained, wear an air-purifying respirator (EN 140) with a Type A/P2 filter or better suitable for organic gases and

vapours with a boiling point above 65°C. (EN 14387).

Thermal hazards: Wear suitable temperature resistant gloves and protective clothing if the product is heated.

8.2.3 Environmental exposure controls

Inform environmental manager of all incidents involving this product.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data given below are typical values

Appearance:	Clear, straw-coloured liquid.
Odour:	Diesel.
Odour threshold:	Not available.
pH:	Not applicable.
Melting/freezing point:	Not available.
Initial boiling point and boiling range:	165 – 375°C
Flash point:	> 55°C (closed cup)
Evaporation rate:	Not available.
Flammability (solid; gas):	Not applicable.
Upper/lower flammability or explosive limits:	0.5% – 6.0% (v/v in air)
Vapour pressure:	< 0.3 kPa (20°C)
Vapour density:	> 1 (Air = 1)
Relative density:	0.82 – 0.85 (15°C) (Water = 1)
Solubility(ies):	Negligible in water (20°C) Miscible in aromatic solvents.
Partition coefficient: n-octanol/water:	Log Kow: 3.9-6 (approximate)
Auto-ignition temperature:	250-270°C
Decomposition temperature:	Not available.
Viscosity:	4.8 mm^2/s (20°C) 2-4.5 mm^2/s (40°C)
Explosive properties:	Not explosive. Vapour may form explosive mixture in air.
Oxidising properties:	Not oxidising.

9.2 Other information

Pour point: -24°C

SECTION 10: Stability and Reactivity

10.1	**Reactivity**	Reacts with oxidising agents.
10.2	**Chemical stability**	Stable under normal conditions.
10.3	**Possibility of hazardous reactions**	No hazardous reactions expected during normal use.
10.4	**Conditions to avoid**	Keep away from sources of ignition, hot surfaces, direct sunlight. Prevent accumulation of vapours. Contact with incompatible materials.
10.5	**Incompatible materials**	Oxidising agents e.g. chlorates and ammonium nitrate which

may be used in agriculture. Reducing agents. Reducing agents.

10.6 Hazardous decomposition products

Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

No data available on the mixture. The following data are for the product components:

Fuels, diesel:
LD_{50} (oral/rat): > 5,000 mg/kg
LD_{50} (dermal/rabbit): > 4,300 mg/kg
LC_{50} (inhalation/rat (male and female/mist): > 4.1 mg/L air (analytical), 4 h
LC_{50} (inhalation/rat (male/mist): > 5.4 mg/L air (analytical), 4 h
LC_{50} (inhalation/rat (female/mist): > 3.6 mg/L air (analytical), 4 h
Naphthalene:
LD_{50} (oral/rat): > 2,000 mg/kg
LD_{50} (dermal/rat): > 2,500 mg/kg
LC_{50} (inhalation/rat (male and female/vapour): > 0.4 mg/L air (analytical), 4 h

Skin corrosion/irritation

Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious eye damage/irritation

May cause slight eye irritation.

Skin sensitisation

Not expected to be a skin sensitiser.

Respiratory sensitisation

Not expected to be a respiratory sensitiser.

Germ cell mutagenicity

The product does not contain substances classified as mutagenic above the classification thresholds.

Carcinogenicity

May cause cancer. Petroleum middle distillates have been shown to cause skin tumours in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumours are produced through a non-genotoxic mechanism associated with frequent cell damage and repair and that they are not likely to cause tumours in the absence of prolonged skin irritation.

Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Reproductive toxicity

The product does not contain substances classified for reproductive toxicity above the classification thresholds.

Specific Target Organ Toxicity – single exposure	Based on the 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. Risk of aspiration into lungs resulting in chemical pneumonia.

Information on likely routes of exposure

Inhalation	Inhalation of high concentrations of vapours may cause drowsiness or dizziness.
Skin contact	Causes skin irritation. Repeated exposure may cause skin dryness or cracking.
Eye contact	May cause slight eye irritation.
Ingestion	May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia. Ingestion may cause irritation of the mouth and digestive tract.

Symptoms related to the physical, chemical and toxicological characteristics

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of high concentrations of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

Mixture versus substance information

No data available.

Other information

None.

SECTION 12: Ecological Information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Experimental studies on samples of gas oils show acute aquatic toxicity values typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity based on their hydrocarbon compositions.

No data available on the mixture. The following data are for the product components:

Fuels, diesel:
LL_{50} (*Oncorhynchus mykiss*): 21 mg/L, 96 h (WAF)
NOEL (*Oncorhynchus mykiss*): 10 mg/L, 96 h (WAF)
NOEL (*Oncorhynchus mykiss*): 0.083 mg/L, 14 days (WAF) (estimated using PETROTOX computer model)
EL_{50} (*Daphnia magna*): 210 mg/L, 48 h (WAF)
NOEL (*Daphnia magna*): 46 mg/L, 48 h (WAF)
NOEL (*Daphnia magna*): 0.2 mg/L, 21 days (WAF) (estimated using PETROTOX computer model)
EL_{50} (*Pseudokirchnerella subcapitata*): 10 mg/L, 72 h (biomass)
NOEL (*Pseudokirchnerella subcapitata*): 1 mg/L, 72 h (biomass)
EL_{50} (*Pseudokirchnerella subcapitata*): 22 mg/L, 72 h (growth

rate)
NOEL (*Pseudokirchnerella subcapitata*): 1 mg/L, 72 h (growth rate)
EL_{50} (*Tetrahymena pyriformis*): > 1,000 mg/L, 40 h (estimated using PETROTOX computer model)
NOEL (*Tetrahymena pyriformis*): 3.217 mg/L, 40 h (estimated using PETROTOX computer model)

Naphthalene:
LC_{50} (*Pimephales promelas*): 6.08 mg/L, 96 h
LC_{50} (*Oncorhynchus mykiss*): 1.6 mg/L, 96 h
LC_{50} (*Oncorhynchus kisutch*): 2.1 mg/L, 96 h
EC_{50} (*Daphnia magna*): 2.16 mg/L, 48 h
NOEC (*Oncorhynchus kisutch*): 0.37 mg/L, 40 days
NOEC (*Daphnia pulex*): 0.59 mg/L, 125 days

12.2 Persistence and degradability

Based on the known or expected properties of individual components, the product is not expected to be readily biodegradable. Some components are expected to be persistent however other components will be easily degraded by microorganisms under aerobic conditions.

12.3 Bioaccumulative potential

The product components have measured or predicted Log Kow values in the range 3.9 – 6 or above and therefore have a high potential to bioaccumulate. In practice, lower molecular weight compounds will be readily metabolised and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

12.4 Mobility in soil

The product components are immiscible in water and will float on the surface of water. Lower molecular weight components will evaporate from the surface, reducing the risk to aquatic organisms. In air the hydrocarbon components undergo photodegradation by hydroxyl radicals with half lives in the range of less than one day.
The majority of components will be adsorbed onto sediment. Adsorption is the predominant process on release to soil. Adsorbed components will slowly degrade in both water and soil.

12.5 Results of PBT and vPvB assessment

The product does not contain substances assessed to be PBT or vPvB.

12.6 Other adverse effects

None known.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

To be disposed of as hazardous waste. Disposal should be in accordance with local, state or national legislation.

Contaminated adsorbent must be removed in sealed, plastic lined drums and disposed of via an authorised waste disposal contractor. Empty containers retain product residue and can be hazardous. Do not empty into drains; dispose of this material and its container in a safe way.

Suggested EU Waste Code: 13 07 01* (fuel oil and diesel)). Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport Information

ADR

14.1	**UN Number**	1202
14.2	**UN Proper shipping name**	GAS OIL
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Yes
14.6	**Special precautions for the user**	Read SDS and supplier instructions on correct use of the product.

ADN

14.1	**UN Number**	1202
14.2	**UN Proper shipping name**	GAS OIL
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Yes
14.6	**Special precautions for the user**	Read SDS and supplier instructions on correct use of the product.

RID

14.1	**UN Number**	1202
14.2	**UN Proper shipping name**	GAS OIL
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Yes
14.6	**Special precautions for the user**	Read SDS and supplier instructions on correct use of the product.

IATA/ICAO

14.1	**UN Number**	1202
14.2	**UN Proper shipping name**	GAS OIL
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Yes
14.6	**Special precautions for the user**	Read SDS and supplier instructions on correct use of the product.

IMDG

14.1	**UN Number**	1202
14.2	**UN Proper shipping name**	GAS OIL
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Marine pollutant.
14.6	**Special precautions for the user**	Read SDS and supplier instructions on correct use of the product.
14.7	**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code**	The product is not intended to be transported in bulk.

SECTION 15: Regulatory Information

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

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) No. 1907/2006 as amended. The product has been classified in accordance with Regulation (EC) No. 1272/2008 (CLP), Directive 67/548/EEC & Directive 1999/45/EC.

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out.

SECTION 16: Other Information

Full text of relevant R-phrases and/or H-statements:

Hazard Statement(s):	H226: Flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled. H350: May cause cancer. H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long lasting effects. H411: Toxic to aquatic life with long lasting effects.
Supplemental Hazard information (EU):	Not applicable.
Risk phrase(s):	R10: Flammable. R20: Harmful by inhalation. R22: Harmful if swallowed. R38: Irritating to skin. R40: Limited evidence of a carcinogenic effect. R45: May cause cancer. R48: Danger of serious damage to health by prolonged exposure. R65: Harmful: may cause lung damage if swallowed. R67: Vapours may cause drowsiness and dizziness. R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Abbreviations:

CAS:	Chemical Abstracts Service;
EINECS:	European Inventory of Existing Commercial Chemical Substances
EC_{50}:	Effective Concentration 50%
EL_{50}:	Effective Loading rate 50%
LC_{50}:	Lethal Concentration 50%
LD_{50}:	Lethal Dose 50%
LL_{50}:	Lethal Loading rate 50%
LOEL:	Lowest Observed Effect Level
NOEL:	No Observed Effect Level
PBT:	Persistent, Bioaccumulative and Toxic.
RMM:	Risk Management Measures
UVCB:	Substance of Unknown or Variable composition, Complex reaction products or Biological materials

vPvB: Very Persistent and Very Bioaccumulative
WAF: Water Accommodated Fraction

References:

Supplier's Safety Data Sheets
ECHA disseminated REACH dossiers
ECHA Classification and Labelling Inventory
Approved Classification and Labelling Guide (Sixth edition)
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009
Regulation (EC) No. 1272/2008 of the European Parliament and of the council.

Disclaimer:

This safety data sheet contains important information to ensure the safe storage, handling and use of this product, it does not however constitute an assessment of workplace risks.

Users are advised to refer to relevant legislation, approved codes of practice and guidance available from the Health & Safety Executive (website: http://www.hse.gov.uk) and to the IP Codes of Practice available from the Energy Institute (website: http://www.energyinst.org.uk)

Further information:
The above information is based on our current knowledge of the product. The purpose of this data sheet is to describe the product in terms of its safety and environmental requirements. It is the user's responsibility to satisfy themselves as to the application of this information and/or recommendations for their own use.

Version history:

Version:	7.0
Issue date:	31/10/2013
Previous Version:	6.0
Issue date of previous version:	24/11/2011
Sections changed from previous version:	1-16

Annex to extended Safety Data Sheet (eSDS)

1. Manufacture of substance – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills

	immediately. 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 (closed systems):	Handle within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Bulk closed loading and unloading:	Handle within a closed system. Wear suitable gloves tested to EN 374.
Bulk open loading and unloading:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN 374 in combination with basic employee training.
Bulk product storage:	Store substance within a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.021

Frequency and duration of use
Continuous release.

Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0.0001

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

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	90

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 90.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	3,300,000
Assumed domestic sewage treatment plant flow (m^3/d):	10,000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in the PETRORISK file 'Site Specific Production' Worksheet.	

2. Use of substance as an intermediate – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use as an intermediate	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to

	vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)
Specific Environmental Release Category:	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of the substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. 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 (closed systems):	Handle within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Bulk closed loading and unloading:	Handle within a closed system. Wear suitable gloves tested to EN 374.
Bulk closed loading and unloading:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	No other specific measures identified.
Bulk product storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating	

to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	350,000
Fraction of regional tonnage used locally:	0.043

Frequency and duration of use
Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0.001

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

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 51.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0

Organisation measures to prevent/limit release from site
Prevent discharge of undissolved substance to or recover from onsite wastewater.
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	410,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000

Conditions and measures related to external treatment of waste for disposal

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

Conditions and measures related to external recovery of waste

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

Section 3: Exposure Estimation
3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.
Section 4: Guidance to check the compliance with the exposure scenario
4.1 Health
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).

3. Distribution of substance – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Distribution of the substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 2: Formulation of preparations. ERC 3: Formulation in materials. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles. ERC 5: Industrial use resulting in inclusion into or onto a matrix. ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates). ERC 6b: Industrial use of reactive processing aids. ERC 6c: Industrial use of monomers for manufacture of thermoplastics. ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, road/rail car and IBC loading), and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.	

Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. 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 (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Laboratory activities:	No other specific measures identified.
Bulk closed loading and unloading:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Bulk open loading and unloading:	Wear suitable gloves tested to EN 374.
Drum and small package filling:	Wear suitable gloves tested to EN 374.
Equipment cleaning and maintenance:	Wear chemically resistant gloves (tested to EN 374) in combination with ‘basic’ employee training.
Storage:	Store substance within a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause

cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.002
Frequency and duration of use Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.000001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 9.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	410,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
The substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
The substance is consumed during use and no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not	

support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).

4. Formulation and (Re)packing of substance – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Formulation and (Re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 2: Formulation of preparations.
Specific Environmental Release Category:	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, material transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. 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 (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Drum/batch transfers:	Use drum pumps or carefully pour from container. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Bulk transfers:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Mixing operations (open systems):	Provide extract ventilation to points where emissions occur. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Production or preparation or articles by tableting, compression, extrusion or pelletisation:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN 374.
Storage:	Store substance within a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.0011
Frequency and duration of use Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00002
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 60.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	91.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	91.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	680,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	

4.2 Environment
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).

5. Use of substance in metal working fluids/rolling oils – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use in metal working fluids/rolling oils	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 7: Industrial spraying. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 17: Lubrication at high energy conditions and in partly open process.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.7a.v1
Processes, tasks, activities covered	
Covers the use in formulated metal working fluids (MWFs)/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. 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 (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Provide extract ventilation to points where emissions occur.
Bulk transfers:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Filling/preparation of equipment from drums or containers:	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Metal machining operations:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less that 3 to 5 air changes per hour). Wear suitable gloves (tested to EN 374), coveralls and eye protection.
Treatment by dipping and pouring:	Wear suitable gloves tested to EN 374.
Spraying:	Wear chemical-resistant gloves (tested to EN 374) in combination with ‘basic’ employee training.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with ‘basic’ employee training.
Automated metal rolling/forming:	Handle substance within in a predominantly closed system provided with extract ventilation.
Semi-automated metal rolling/forming:	Provide extract ventilation to points where emissions occur.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with ‘basic’ employee training.
Storage:	Store substance in a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	10,000
Fraction of regional tonnage used locally:	0.01
Frequency and duration of use Continuous release.	
Emission days (days/year):	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	0.000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	78,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).

6. Use of substance as release agents or binders – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 7: Industrial spraying. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for

	indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers:	Handle substance within a closed system.
Drum/batch transfers:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Mould forming:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Casting operations (open systems):	Minimise exposure by partial enclosure for the operation or equipment and provide extract ventilation at openings. Wear suitable gloves tested to EN 374.
Machine spraying:	Minimise exposure by extracted full enclosure for the operation or equipment. Wear suitable gloves tested to EN 374.
Manual spraying:	Wear a full face respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with specific activity training.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	14,000
Fraction of regional tonnage used locally:	0.18

Frequency and duration of use
Continuous release.

Emission days (days/year):	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	0.0000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 59.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	170,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).	

7. Use of substance as release agents or binders – Professional

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 11: Non-industrial spraying. PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Environmental Release Category(ies):	ERC 8a: Wide dispersive indoor use of processing aids in open systems. ERC 8d: Wide dispersive outdoor use of processing aids in open systems.
Specific Environmental Release Category:	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying and brushing and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide

	basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Material transfers (closed systems):	No other specific measures identified.
Drum/batch transfers:	Wear suitable gloves tested to EN 374.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	Wear suitable gloves tested to EN 374.
Mould forming:	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN 374.
Casting operations with local exhaust ventilation:	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN 374.
Casting operations without local exhaust ventilation:	Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection.
Manual spraying with local exhaust ventilation:	Carry out in a vented booth or extracted enclosure. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual spraying without local exhaust ventilation:	Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with specific activity employee training.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance in a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	2,900
Fraction of regional tonnage used locally:	0.0005

Frequency and duration of use
Continuous release.

Emission days (days/year):	365

Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	62
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).	

8. Use of substance as a fuel – Industrial

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. 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 EN 374.
Drum/batch transfers:	Wear suitable gloves tested to EN 374.
Use as a fuel (closed systems):	No other specific measures identified.

Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	4,500,000
Fraction of regional tonnage used locally:	0.34

Frequency and duration of use
Continuous release.

Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.005
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0

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

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 60.4

Organisation measures to prevent/limit release from site
Prevent discharge of undissolved substance to or recover from onsite wastewater.
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	5,500,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).	

9. Use of substance as a fuel – Professional

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 9a: Wide dispersive indoor use of substances in closed systems. ERC 9b: Wide dispersive outdoor use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	

Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
General measures applicable to all activities:	Control of 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 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 the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean 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.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. 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 EN 374.
Drum/batch transfers:	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN 374.
Refuelling:	Wear suitable gloves tested to EN 374.
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.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2

of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	6,700,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.0001
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	140,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support	

the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may or 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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).

10. Use of substance as a fuel – Consumer

Section 1: Exposure scenario **Vacuum of Hydrocracked Gas Oils and Distillate Fuels**	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 21: Consumer uses: Private households (= general public = consumers).
Product Category(ies):	PC 13: Fuels.
Environmental Release Category(ies):	ERC 9a: Wide dispersive indoor use of substances in closed systems. ERC 9b: Wide dispersive outdoor use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses of liquid fuels.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: > 10 Pa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Amounts used:	For each use event, covers use amounts of up to 37,500 g. Covers skin contact area of up to 420 cm^2.
Frequency and duration of use:	Covers use up to 0.143 times per day (i.e. one use every 7 days). Covers exposure of up to 2 hours per use event.
Contributing Scenarios	
Contributing Scenarios/Product Category	**Specific Risk Management Measures & Operating Conditions**
Liquid: Automotive refuelling	Covers concentrations of up to 100%. Covers use up to 52 days/year. Covers use up to 1 time per day. Covers skin contact area up to 210 cm^2. For each use event, covers use amounts up to 37,500 g. Covers outdoor use. Covers use in room size of 100 m^3. Covers exposure of up to 0.05 hours (3 min) per use event. No specific risk management measures identified beyond those operational conditions stated.
Liquid: Garden equipment - Use	Covers concentrations of up to 100%. Covers use up to 26 days/year. Covers use up to 1 time a day. For each use event, covers use amounts up to 750 g. Covers outdoor use. Covers use in room size of 100 m^3. Covers exposure of up to 2 hours per use event. No specific risk management measures identified beyond those operational conditions stated.
Liquid: Garden equipment - refuelling	Covers concentrations of up to 100%.

	Covers use up to 26 days/year. Covers use up to 1 time a day. Covers skin contact area up to 420 cm^2. For each use event, covers use amounts up to 750 g. Covers use in a one car garage (34 m^3) under typical ventilation. Covers use in room size of 34 m^3. Covers exposure of up to 0.03 hours (1.8 min). No specific risk management measures identified beyond those operational conditions stated.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics
Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	16,000,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	350,000
Assumed domestic sewage treatment plant flow (m^3/d):	2,000

Conditions and measures related to external treatment of waste for disposal

Combustion emissions limited by required exhaust emission controls.
Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

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

Section 3: Exposure Estimation

3.1 Health

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

3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.
Section 4: Guidance to check the compliance with the exposure scenario
4.1 Health
Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.
4.2 Environment
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Envirnonmental-Release-Classes.pdf).

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Commercial Product Name
SUPERFLOC C-498HMW

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

Use of the Substance/Mixture

Water treatment chemical

Recommended restrictions on use

-

1.3 Details of the supplier of the safety data sheet

Kemira Oyj
P.O. Box 33000101 HELSINKI FINLAND
Telephone+358108611, Telefax. +358108621124
ProductSafety.FI.Helsinki@kemira.com

1.4 Emergency telephone number

Carechem 24 International: +44 (0) 1235 239 670

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EU) 1272/2008(CLP)
Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.;

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard statements	:	Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.
	EUH210	Safety data sheet available on request.

2.3 Other hazards

Advice; Forms slippery/greasy layers with water.
Potential environmental effects; This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical nature of the mixture: Cationic polyacrylamide.

CAS/EU number/REACH Registration Number	Chemical name of the substance	Concentration	Classification according to Regulation (EU) 1272/2008(CLP)
77-92-9 201-069-1 01-2119457026-42	Citric acid	0 - 9.9 %	Eye Irrit. Category 2,H319
124-04-9 204-673-3 01-2119457561-38	Adipic acid	0 - 5 %	Eye Irrit. Category 2,H319

The total combined concentration of Adipic acid and Citric acid does not exceed 9.9%.

Further information

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Show this safety data sheet to the doctor in attendance.

Inhalation

Remove to fresh air. If symptoms persist, call a physician.

Skin contact

Wash off immediately with soap and plenty of water.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Ingestion

Rinse mouth with water. Call a physician immediately. Do NOT induce vomiting. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : No information available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Symptomatic treatment.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Extinguishing media : Water spray
Dry chemical
Carbon dioxide (CO2)

Unsuitable extinguishing media : none

5.2 Special hazards arising from the substance or mixture

Dust may form explosive mixture in air.

5.3 Advice for firefighters

Wear self-contained breathing apparatus and protective suit.

5.4 Specific methods

Avoid dust accumulation.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For personal protection see section 8.

6.2 Environmental precautions

Try to prevent the material from entering drains or water courses.

6.3 Methods and materials for containment and cleaning up

Product becomes slippery when it is wet. Sweep up and shovel into suitable containers for disposal. Flush with water. Prevent product from entering drains.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

The product is hygroscopic. Protect from moisture. Avoid dust formation.

7.2 Conditions for safe storage, including any incompatibilities

Store at room temperature in the original container.

Materials for packaging

Unsuitable material: To avoid product degradation and equipment corrosion, do not use iron, copper or aluminium containers or equipment.

Materials to avoid:

Strong oxidizing agents

Storage stability:

Storage temperature	4 - 27 °C
Other data	Stable under recommended storage conditions.

7.3 Specific end use(s)

Not listed

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Contains no substances with occupational exposure limit values.

PNEC : No data available

8.2 Exposure controls

8.2.1 **Appropriate engineering controls**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes and clothing. Do not breathe dust. Ensure that eyewash stations and safety showers are close to the workstation location.
Ensure adequate ventilation.

8.2.2 Individual protection measures, such as personal protective equipment

Hand protection

Glove material: Nitrile rubber, Protective gloves complying with EN 374.Permeability tests are not available for this product.Please observe the instructions regarding permeability and breakthrough time

which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection

Safety glasses with side-shields conforming to EN166

Skin and body protection

Protective clothing.

Respiratory protection

Dust safety masks are recommended when the dust concentration is more than 10 mg/m³. Half mask with a particle filter P2 (EN 143)

8.2.3 Environmental exposure controls

No data available

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

General Information (appearance, odour)

Physical state	solid, crystalline, powder
Colour	off-white
Odour	odourless
Odour Threshold	Not relevant

Important health safety and environmental information

pH	3 - 5 (0.5 %) (as aqueous solution)
Melting point/range	No data available
Boiling point/boiling range	Not applicable
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability (solid, gas) :	No data available
Explosive properties:	
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapour pressure	Not applicable

Relative vapour density	Not applicable
Bulk density	750 kg/m³
Solubility(ies):	
Water solubility	Limited by viscosity.
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature	> 150 °C
Thermal decomposition	> 150 °C
Viscosity:	
Viscosity, dynamic	Not applicable
Oxidizing	The substance or mixture is not classified as oxidizing.
Saturation in air (% vol.)	Not applicable

9.2 Other data

Surface tension	Not applicable

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Hazardous polymerisation does not occur.

10.4 Conditions to avoid

Conditions to avoid : Avoid contact with alkaline materials which will degrade the polymer.

10.5 Incompatible materials

Materials to avoid : Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products : Ammonia
Carbon oxides (COx)
Nitrogen oxides (NOx)
hydrogen chloride (HCl)

Thermal decomposition : > 150 °C

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

The acute toxicological results displayed may not be the results of actual testing of this material but based on a similar tested material.
LD50/Oral/Rat: > 5,000 mg/kg
Remarks:estimated
LC50/Inhalation/4 h/Rat: 20 mg/l
Remarks: estimated

LD50/Dermal/Rabbit: > 2,000 mg/kg
Remarks: estimated

Irritation and corrosion

Skin:
No skin irritation

Eyes:
No eye irritation

Sensitisation

Not sensitizing.

Long term toxicity

Repeated dose toxicity

Remarks: No data available

Carcinogenicity

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

Mutagenicity

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

Reproductive toxicity

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

STOT - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration toxicity No aspiration toxicity classification

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Aquatic toxicity

Ecotoxicological information provided is based on a structurally or compositionally similar product. This material is not classified as dangerous for the environment. The effects on aquatic organisms are due to an external (non-systemic) mode of action and are significantly reduced (by a factor of 7-20) within 30 minutes due to the binding of the product to dissolved organic carbon and inorganic sorbents such as clays and silts.

LC50/96 h/Branchydanio rerio (zebra fish)/Acute toxicity/OECD Test Guideline 203: > 1 - 10 mg/l
EC50/48 h/Daphnia magna (Water flea)/Immobilization/OECD Test Guideline 202: > 10 - 100 mg/l
IC50/algae/Growth inhibition/OECD Test Guideline 201:
Due to the cationicity of the polymer, test is not appropriate.

Toxicity to other organisms

No data available

12.2 Persistence and degradability

Biological degradability:
CO2 Evolution Test/OECD Test Guideline 301B/28 d:

The polymeric ingredient is not readily biodegradable, but degradable by hydrolysis.

12.3 Bioaccumulative potential

Bioaccumulation is unlikely. Because of the high molecular weight of the polymer diffusion through biological membranes is very small.
Partition coefficient: n-octanol/water: Not applicable

12.4.Mobility in soil

Mobility

Water solubility: Limited by viscosity.
Surface tension: Not applicable

12.5. Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No information available.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product	Recycling, recovery and reuse of materials is recommended if permitted by regulations.If recycling is not practicable, dispose of in compliance with local regulations.
Contaminated packaging	Dirty package must be disposed of in the same way as the product itself.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number

Land transport	Not classified as dangerous in the meaning of transport regulations.
Sea transport	Not classified as dangerous in the meaning of transport regulations.
Air transport	Not classified as dangerous in the meaning of transport regulations.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not classified as dangerous in the meaning of transport regulations.

14.8 Special precautions for user

None known.

SECTION 15: REGULATORY INFORMATION

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

Other regulations	:	This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

Notification status

TSCA	:	All components of this product are included in the United States TSCA Chemical Inventory or are not required to be listed on the United States TSCA Chemical Inventory.
DSL	:	All components of this product are included in the Canada Domestic Substance List (DSL) or are not required to be listed on the Canada Domestic Substance List (DSL).
	:	
EINECS	:	All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) or are not required to be listed on EINECS.
AICS	:	All components of this product are included in the Australian Inventory of Chemical Substances (AICS) or are not required to be listed on the Australian Inventory of Chemical Substances (AICS).
IECSC	:	All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.
ENCS	:	All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese (ENCS) inventory.
KECI	:	All components of this product are included in the Korean (ECL) inventory or are not required to be listed on the Korean (ECL) inventory.
PICCS	:	All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine (PICCS) inventory.
NZIoC	:	All components of this product are included in the New Zealand inventory (NZIoC) or are not required to be listed on the New Zealand inventory(NZIoC).
TCSI	:	All components of this product are included on the Taiwan Toxic Chemical Substances Control Act Inventory.

15.2 Chemical safety assessment

A Chemical Safety Assessment is not required for this mixture.

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under section 3.

H319	Causes serious eye irritation.
H319	Causes serious eye irritation.

Training advice

Read the safety data sheet before using the product.

Further information

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.

Sources of key data used to compile the Safety Data Sheet

Regulations, databases, literature, own tests.

Additions, Deletions, Revisions

Relevant changes have been marked with vertical lines.

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

Product Name: **FLOFOAM 139F**

Supplier: **SNF (UK) LIMITED**
Solutions House, Ripley Close,
Normanton Industrial Estate
Normanton, WF6 1TB.

Telephone Number: +44 (0) 1924 311000 **Fax:** +44 (0) 1924 311099

Product Use: Process aid for industrial applications.

2. HAZARDS IDENTIFICATION

This product is not hazardous to health according to EC criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components presenting hazards : Blend of hydrocarbons, fatty acid esters and surfactants.

Hazardous	CAS No	Concentration	R Phrase	Classification
Component				
Kerosene	064742-81-0	<55%	R65	Xn

4. FIRST AID MEASURES

Product in eyes : Wash thoroughly with water. If irritation persists, seek medical advice.

Product on skin : Remove all contaminated clothing and footwear. Wash with soap and water. In case of persistent skin irritation, consult a physician.

Product inhaled : No hazard anticipated.

Product ingested : Do not induce vomiting. Give milk to drink. Seek medical advice.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : WATER SPRAY, FOAM, CARBON DIOXIDE (CO2), POWDERS, AQUEOUS FILM FORMING FOAM (AFFF).

Unsuitable extinguishing media : Strong water jet.

Specific hazards : NOT classified as flammable according to EC criteria, but may present a risk in the event of a fire.
Combustible liquid. However, it does not catch fire easily.

6. ACCIDENTAL RELEASE MEASURES

Wash small spillages away with cold water. Absorb large spillages with sand or earth.
Dispose in accordance with national and local regulations.

7. HANDLING AND STORAGE

Store between 5^{o}C and 30^{o}C. Extremes of temperature may adversely affect viscosity and stability.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures : No specific measures are required provided the product is handled in accordance with the general rules of occupational hygiene and safety.

Personal protective equipment :
Hand protection : Protective gloves.

Eye Protection : Goggles or visor.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Clear amber liquid.
S.G.: Approx 0.88.

10. STABILITY AND REACTIVITY

No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

Product in eyes : This product is mildly irritating to the eyes.

Product on skin : Moderately irritant to the skin, prolonged contact may cause dermatitis.

Product inhaled : No hazard anticipated.

Product ingested : This product has low systemic toxicity. If aspiration occurs (e.g. during vomiting) this can lead to intense irritation of the lung tissue, and chemically induced pneumonia.

12. ECOLOGICAL INFORMATION

OECD 301D Biodegradability test. 14 days >80% Biodegradation.

13. DISPOSAL CONSIDERATIONS

Incineration under approved conditions.

14. TRANSPORT INFORMATION

This product is not classified as dangerous.

15. REGULATORY INFORMATION

EC Labelling

- Symbol (s)	None.
- R Phrase (s)	None.
- S Phrase (s)	None.

16. OTHER INFORMATION

Further information:

This MSDS was prepared in accordance with the following:

Council Directive 92/32/EEC of 30 April 1992 amending for the seventh time Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and all subsequent adaptations to technical progress.

Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.

Commission Directive 2001/58/EC of 27 July 2001 amending for the second time Directive 91/155/EEC defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of European Parliament and Council Directive 1999/45/EC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC (safety data sheets).

ISO 110140-1 : Material Safety Data Sheet for Chemical Product.

Contact: SNF (UK) Ltd.
Tele: 01924 311000

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 *Version number 1* *Revision: 21.03.2018*

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

· **1.1 Product identifier**

· **Trade name: AGITAN® DF 681F**

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
· **Application of the substance / the mixture** Defoamers, Anti-foaming agent

· **1.3 Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
MÜNZING CHEMIE GmbH
Münzingstrasse 2
74232 Abstatt, Germany
E-Mail: info@munzing.com
Tel.: +49 7131 987-100

· **Further information obtainable from:**
Product Safety Department
E-mail (MSDS): msds@munzing.com
· **1.4 Emergency telephone number:** For Chemical Emergencies: CHEMTREC: +1 703 741 5970

SECTION 2: Hazards identification

· **2.1 Classification of the substance or mixture**
· **Classification according to Regulation (EC) No 1272/2008**
The product is not classified as hazardous, according to the CLP regulation.

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008** Void
· **Hazard pictograms** Void
· **Signal word** Void
· **Hazard statements** Void
· **Additional information:**
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.
Safety data sheet available on request.
· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** None.
· **vPvB:** None.

*
SECTION 3: Composition/information on ingredients

· **3.2 Chemical characterisation: Mixtures**
· **Description:**
hydrocarbons
non-ionic emulsifiers

· **Dangerous components:**

CAS: 64742-56-9 EINECS: 265-159-2 Reg.nr.: 01-2119480132-48	Distillates (petroleum), solvent-dewaxed light paraffinic Asp. Tox. 1, H304	75-100%

· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

(Contd. on page 2)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 *Version number 1* *Revision: 21.03.2018*

Trade name: AGITAN® DF 681F

(Contd. of page 1)

SECTION 4: First aid measures

· ***4.1 Description of first aid measures***
· ***General information:*** *Immediately remove any clothing soiled by the product.*
· ***After inhalation:*** *Supply fresh air; consult doctor in case of complaints.*
· ***After skin contact:*** *Immediately wash with water and soap and rinse thoroughly.*
· ***After eye contact:***
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· ***After swallowing:*** *If symptoms persist consult doctor.*
· ***4.2 Most important symptoms and effects, both acute and delayed*** *No further relevant information available.*
· ***4.3 Indication of any immediate medical attention and special treatment needed***
No further relevant information available.

SECTION 5: Firefighting measures

· ***5.1 Extinguishing media***
· ***Suitable extinguishing agents:***
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· ***For safety reasons unsuitable extinguishing agents:*** *Water with full jet*
· ***5.2 Special hazards arising from the substance or mixture*** *No further relevant information available.*
· ***5.3 Advice for firefighters***
· ***Protective equipment:*** *Do not inhale explosion gases or combustion gases.*
· ***Additional information***
Cool endangered receptacles with water spray.
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

SECTION 6: Accidental release measures

· ***6.1 Personal precautions, protective equipment and emergency procedures***
Wear protective clothing.
Particular danger of slipping on leaked/spilled product.
· ***6.2 Environmental precautions:***
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· ***6.3 Methods and material for containment and cleaning up:***
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
· ***6.4 Reference to other sections***
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

· ***7.1 Precautions for safe handling***
Keep away from heat and direct sunlight.
Prevent formation of aerosols.
· ***Information about fire - and explosion protection:***
Protect from heat.
Keep ignition sources away - Do not smoke.

(Contd. on page 3)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 Version number 1 Revision: 21.03.2018

Trade name: AGITAN® DF 681F

(Contd. of page 2)

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Store away from oxidising agents.
· **Further information about storage conditions:** Store in cool, dry conditions in well sealed receptacles.
· **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**	
CAS: 64742-56-9 Distillates (petroleum), solvent-dewaxed light paraffinic	
ACGIH-TWA	Long-term value: 5 mg/m³ mineral oil mist

· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
The usual precautionary measures are to be adhered to when handling chemicals.
Avoid contact with the eyes and skin.
· **Respiratory protection:** Use suitable respiratory protective device only when aerosol or mist is formed.
· **Protection of hands:**
Only use chemical-protective gloves with CE-labelling of category III.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.4 mm
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
For the mixture of chemicals mentioned below the penetration time has to be at least 480 minutes (Permeation according to EN 16523-1:2015: Level 6).
The determined penetration times according to EN 16523-1:2015 are not performed under practical conditions. Therefore a maximum wearing time, which corresponds to 50% of the penetration time, is recommended.
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:** Safety glasses
· **Body protection:** Protective work clothing

(Contd. on page 4)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 *Version number 1* *Revision: 21.03.2018*

Trade name: AGITAN® DF 681F

(Contd. of page 3)

SECTION 9: Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Colour:	Yellowish
· **Odour:**	Slight
· **Odour threshold:**	Not determined.
· **pH-value (20 g/l) at 20 °C:**	≈ 7 (DIN ISO 976)
· **Change in condition**	
Melting point/freezing point:	Undetermined.
Initial boiling point and boiling range:	Undetermined.
· **Flash point:**	> 100 °C (DIN EN ISO 2719)
· **Flammability (solid, gas):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto-ignition temperature:**	Product is not selfigniting.
· **Explosive properties:**	Product is not explosive. However, formation of explosive air/ vapour mixtures are possible.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Oxidising properties**	None.
· **Vapour pressure:**	Not determined.
· **Density at 20 °C:**	≈ 0.88 g/cm³ (DIN EN ISO 2811-1)
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with water:**	Insoluble.
· **Partition coefficient: n-octanol/water:**	Not determined.
· **Viscosity:**	
Dynamic at 20 °C:	≈ 600 mPas (DIN EN ISO 3219)
Kinematic at 40 °C:	>20.5 mm²/s (DIN EN ISO 51562)
· **9.2 Other information**	No further relevant information available.

SECTION 10: Stability and reactivity

· **10.1 Reactivity** No further relevant information available.
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **10.3 Possibility of hazardous reactions**
Flammable vapour-air mixtures may develop if stored in large receptacles and above room temperature.
Can react violently with oxygen rich (oxidising) material. Danger of Explosion.
· **10.4 Conditions to avoid** No further relevant information available.
· **10.5 Incompatible materials:** No further relevant information available.

(Contd. on page 5)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 Version number 1 Revision: 21.03.2018

Trade name: AGITAN® DF 681F

(Contd. of page 4)

· **10.6 Hazardous decomposition products:** No dangerous decomposition products known.

SECTION 11: Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity** Based on available data, the classification criteria are not met.

· **LD/LC50 values relevant for classification:**		
CAS: 64742-56-9 Distillates (petroleum), solvent-dewaxed light paraffinic		
Oral	LD50	>5,000 mg/kg (rat)
Dermal	LD50	>5,000 mg/kg (rabbit)

· **Primary irritant effect:**
· **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
· **Serious eye damage/irritation** Based on available data, the classification criteria are not met.
· **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
· **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)**
· **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
· **Carcinogenicity** Based on available data, the classification criteria are not met.
· **Reproductive toxicity** Based on available data, the classification criteria are not met.
· **STOT-single exposure** Based on available data, the classification criteria are not met.
· **STOT-repeated exposure** Based on available data, the classification criteria are not met.
· **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**	
CAS: 64742-56-9 Distillates (petroleum), solvent-dewaxed light paraffinic	
LL50	>100 mg/l (daphnia)
EL50	>100 mg/l (alga)
	>100 mg/l (fish)

· **12.2 Persistence and degradability**
A part of the components is heavily biodegradable.
A part of the single components easily eliminable from water.
· **12.3 Bioaccumulative potential** No further relevant information available.
· **12.4 Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Behaviour in sewage processing plants:**
Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations. Do not release untreated into natural waters.
· **Additional ecological information:**
· **General notes:**
Due to available data on eliminability/decomposition and bioaccumulation potential a prolonged damage of the environment is unlikely.
According to the criteria of the EU-classification and labelling "dangerous for environment"(93/21/EWG) the substance/ the product has to be classified as non-hazardous for the environment.
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **12.5 Results of PBT and vPvB assessment**
According to Annex XIV of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not contain a substance fullfilling the

(Contd. on page 6)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 Version number 1 Revision: 21.03.2018

Trade name: AGITAN® DF 681F

(Contd. of page 5)

PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria.
Self classification.
· **12.6 Other adverse effects** *No further relevant information available.*

SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **European waste catalogue**	
16 03 06	organic wastes other than those mentioned in 16 03 05

· **Uncleaned packaging:**
· **Recommendation:** *Disposal must be made according to official regulations.*
· **Recommended cleansing agents:** *Water, if necessary together with cleansing agents.*

SECTION 14: Transport information

· **14.1 UN-Number** · **ADR/RID/ADN, ADN, IMDG, IATA**	Void
· **14.2 UN proper shipping name** · **ADR/RID/ADN, ADN, IMDG, IATA**	Void
· **14.3 Transport hazard class(es)** · **ADR/RID/ADN, ADN, IMDG, IATA** · **Class**	Void
· **14.4 Packing group** · **ADR/RID/ADN, IMDG, IATA**	Void
· **14.5 Environmental hazards:** · **Marine pollutant:**	No
· **14.6 Special precautions for user**	Not applicable.
· **14.7 Transport in bulk according to Annex II of Marpol and the IBC Code**	Not applicable.
· **Transport/Additional information:**	Not a dangerous good to the above specifications.
· **UN "Model Regulation":**	Void

SECTION 15: Regulatory information

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

· **Directive 2012/18/EU**
· **Named dangerous substances - ANNEX I** *None of the ingredients is listed.*
· **National regulations:**

· **Waterhazard class:** *Water hazard class 1 (German AwSV, Self-assessment): slightly hazardous for water.*
· **15.2 Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

(Contd. on page 7)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 26.03.2020 *Version number 1* *Revision: 21.03.2018*

Trade name: AGITAN® DF 681F

(Contd. of page 6)

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· ***Relevant phrases***
H304 May be fatal if swallowed and enters airways.

· ***Department issuing SDS:***
Product Safety Department
E-Mail: msds@munzing.com

· ***Abbreviations and acronyms:***
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Asp. Tox. 1: Aspiration hazard – Category 1

· **** Data compared to the previous version altered.***

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Sodium hypochlorite 10-15% (All grades)

Version 7.1
Revision Date 2011/01/20

Print Date 2011/01/20
MSDS code: MSHY100

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name	:	Sodium hypochlorite 10-15% (All grades)
Substance name	:	sodium hypochlorite, solution 10-15 % Cl active
Index-No.	:	017-011-00-1
CAS-No.	:	7681-52-9
EC-No.	:	231-668-3

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

Use of the Substance/Mixture	:	At this time we do not yet have information on identified uses. They will be included in this safety data sheet when available.
Recommended restrictions on use	:	At that time we do not yet have information on use restrictions. They will be included in this safety data sheet when available.

1.3. Details of the supplier of the safety data sheet

Company	:	Brenntag UK & Ireland Albion House, Rawdon Park GB LS19 7XX Leeds Yeadon
Telephone	:	0113 3879 200
Telefax	:	0113 3879 280
E-mail address	:	msds@brenntag.co.uk

1.4. Emergency telephone number

Emergency telephone number	:	Emergency only telephone number (open 24 hours): 01865 407333 (N.C.E.C. Culham)

2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008

Hazard class	Hazard category	Target Organs	Hazard statements
Skin corrosion	**Category 1B**		**H314**
Acute aquatic toxicity	**Category 1**		**H400**

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Directive 67/548/EEC or 1999/45/EC	
Hazard symbol / Category of danger	**Risk phrases**
Corrosive (C)	R34
	R31
Dangerous for the environment (N)	R50

For the full text of the R-phrases mentioned in this Section, see Section 16.

Most important adverse effects

Human Health : See section 11 for toxicological information.
No further information available.

Physical and chemical hazards : See section 9 for physicochemical information., No further information available.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :

Signal word : Danger

Hazard statements	:	H314	Causes severe skin burns and eye damage.
		H400	Very toxic to aquatic life.
Precautionary statements			
Prevention	:	P260	Do not breathe vapours.
		P273	Avoid release to the environment.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	:	P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
		P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Additional Labelling:

EUH031 Contact with acids liberates toxic gas.

Hazardous components which must be listed on the label:

- sodium hypochlorite, solution

2.3. Other hazards

No other information is available.

3. Composition/information on ingredients

3.1. Substances

Chemical nature : sodium hypochlorite
Aqueous solution

Chemical Name	Identification Number	Amount [%]

sodium hypochlorite, solution	Index-No. : 017-011-00-1 CAS-No. : 7681-52-9 EC-No. : 231-668-3 Registration number : 01-2119488154-34-xxxx		>= 10 - <= 15
sodium hydroxide	Index-No. : 011-002-00-6 CAS-No. : 1310-73-2 EC-No. : 215-185-5		>= 0 - < 5

4. First aid measures

4.1 Description of first aid measures

General advice : Take off all contaminated clothing immediately.

If inhaled : In case of accident by inhalation: remove casualty to fresh air and keep at rest. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

In case of skin contact : Wash off immediately with soap and plenty of water. If irritation appears or if the contamination is important, seek medical advice.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.

If swallowed : Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. If swallowed, do not induce vomiting - seek medical advice. If a person vomits when lying on his back, place him in the recovery position.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Inhalation may provoke the following symptoms:
Cough
Headache
Lung oedema

Effects : Risk of serious damage to the lungs (by aspiration).

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.
Later control for pneumonia and lung oedema.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
The product itself does not burn.

Unsuitable extinguishing media : Exempt

5.2. Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Fire may cause evolution of:
Chlorine
Hydrogen chloride gas
chlorine oxides

5.3. Advice for firefighters

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.
Wear appropriate body protection (full protective suit)

Further information : Cool closed containers exposed to fire with water spray.
Heating will cause a pressure rise - with risk of bursting.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment. Wear respiratory

protection. Keep people away from and upwind of spill/leak. Provide adequate ventilation. Danger of slipping if spilled Avoid contact with skin and eyes. Do not breathe vapour.

6.2 Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities. If material reaches soil inform authorities responsible for such cases.

6.3 Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal.
Further information	:	Treat recovered material as described in the section "Disposal considerations".

6.4 Reference to other sections

For personal protection see section 8.

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Do not keep the container sealed. Handle and open container with care. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Use respirator with appropriate filter if vapours or aerosol are released. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.
Hygiene measures	:	Keep away from food, drink and animal feedingstuffs. Smoking,

eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep in an area equipped with alkali resistant flooring. Keep only in the original container. Store in a receptacle equipped with a vent.
Advice on protection against fire and explosion	:	The product is not flammable. Normal measures for preventive fire protection.
Further information on storage conditions	:	Keep in a well-ventilated place. Protect against light. Store in cool place. Do not keep the container sealed.
Advice on common storage	:	Keep away from food, drink and animal feedingstuffs. Do not store together with acids and ammonium salts.
German storage class	:	8B: Non-combustible substances, corrosive

7.3 Specific end uses

Specific use(s) : No information available.

8. Exposure controls/personal protection

8.1. Control parameters

Component: sodium hydroxide	**CAS-No. 1310-73-2**

Other OELs

Regulatory Basis	:	UK. EH40 Workplace Exposure Limits (WELs)
Regulatory List	:	EH40 WEL
Value type	:	Short Term Exposure Limit (STEL):
Value	:	2 mg/m3

Component: chlorine	**CAS-No. 7782-50-5**

Other OELs

Regulatory Basis	:	EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents.
Regulatory List	:	EU ELV
Value type	:	Short Term Exposure Limit (STEL):
Value	:	0.5 ppm
Value	:	1.5 mg/m3
Remarks	:	Indicative

Regulatory Basis	:	UK. EH40 Workplace Exposure Limits (WELs)
Regulatory List	:	EH40 WEL
Value type	:	Short Term Exposure Limit (STEL):
Value	:	0.5 ppm
Value	:	1.5 mg/m3

8.2. Exposure controls

Engineering measures

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice	:	Use respirator with appropriate filter if vapours or aerosol are released. Recommended Filter type: Combination filter:B-P2 Combination filter:B-P3

Hand protection

Advice	:	The glove material has to be impermeable and resistant to the product / the substance / the preparation. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear.
Material	:	butyl-rubber
Gloves	:	8 h
Glove thickness	:	0.5 mm

Material	:	Polyvinylchloride
Gloves	:	8 h
Glove thickness	:	0.5 mm

Material	:	polychloroprene
Gloves	:	8 h
Glove thickness	:	0.5 mm

Eye protection

Advice	:	Tightly fitting safety goggles

Skin and body protection

Advice	:	alkali resistant protective clothing

Environmental exposure controls

General advice	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities.

If material reaches soil inform authorities responsible for such cases.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	:	liquid
Colour	:	yellowish green
Odour	:	slight chlorine
Odour Threshold	:	Currently we do not have any Information from our supplier about this.
pH	:	> 11
Melting point/range	:	-17 °C
Boiling point/boiling range	:	110 °C
Flash point	:	not applicable
Evaporation rate	:	Currently we do not have any Information from our supplier about this.
Flammability (solid, gas)	:	does not ignite
Upper explosion limit	:	not applicable
Lower explosion limit	:	not applicable
Vapour pressure	:	Currently we do not have any Information from our supplier about this.
Relative vapour density	:	> 1.0 (Air = 1.0)
Density	:	1.2 - 1.3 g/cm3
Water solubility	:	completely soluble
Partition coefficient: n-octanol/water	:	Currently we do not have any Information from our supplier about this.

Ignition temperature	:	not applicable
Thermal decomposition	:	Currently we do not have any Information from our supplier about this.
Viscosity, dynamic	:	3.45 mPa.s 20 °C (Aqueous, solution, 15 %)
Explosive properties	:	Not explosive
Oxidizing properties	:	Currently we do not have any Information from our supplier about this.

9.2 Other information

No further information available.

10. Stability and reactivity

10.1. Reactivity

Advice : This product is a very reactive substance that can react with many inorganic and organic compounds.

10.2. Chemical stability

Advice : Decomposes on heating.
Decomposes on exposure to light.

10.3. Possibility of hazardous reactions

Hazardous reactions : May develop chlorine if mixed with acidic solutions.

10.4. Conditions to avoid

Conditions to avoid : Heat.

10.5. Incompatible materials

Materials to avoid : Acids
ammonium compounds
Acetic anhydride
Organic materials
Hydrogen peroxide

metal salts
Copper
Nickel
Iron

10.6. Hazardous decomposition products

Hazardous decomposition products : Hydrogen chloride gas
Chlorine
chlorine oxides

11. Toxicological information

11.1. Information on toxicological effects

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**

Acute toxicity

Oral

Value type : LD50
Value : 2,900 - 3,400 mg/kg
Species : mouse
Remarks : Cause serious burns with severe pains, vomiting, pains in the stomach, possibly chock and damaged kidneys. The burn may occur even if only small amounts have been swallowed.

Inhalation

Value type : LC50
Value : > 10.5 mg/l
Species : rat

Dermal

Value type : LD50

Value	:	> 2,000 mg/kg
Species	:	rabbit

Irritation

Skin

Species	:	rabbit
Result	:	Severe skin irritation
Method	:	OECD Test Guideline 404

Species	:	human.
Result	:	corrosive effects

Eyes

Species	:	rabbit
Result	:	corrosive effects
Remarks	:	Risk of serious damage to eyes.

Sensitisation

Species	:	guinea pig
Result	:	not sensitizing

Further information

Other relevant toxicity information	:	All numerical values for acute toxicity are calculated on the pure substances. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach. Handle in accordance with good industrial hygiene and safety practice.

12. Ecological information

12.1. Toxicity

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**

Acute toxicity

Fish

Species	:	Pimephales promelas
Exposure Time	:	96 h
Value type	:	LC50
Value	:	0.22 - 0.62 mg/l

Toxicity to daphnia and other aquatic invertebrates.

Species	:	Daphnia magna
Exposure time	:	96 h
Value type	:	EC50
Value	:	2.1 mg/l

algae

Species	:	Desmodesmus subspicatus (green algae)
Exposure time	:	24 h
Value type	:	EC50
Value	:	28 mg/l

12.2. Persistence and degradability

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**

Persistence and degradability

Persistence

Remarks	:	no data available

Biodegradability

Remarks : The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**
Bioaccumulation		

Remarks : Bioaccumulation is not expected.

12.4. Mobility in soil

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**
Mobility		

Remarks : The product is mobile in water enviroment.

12.5. Results of PBT and vPvB assessment

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**
Results of PBT and vPvB assessment		

Remarks : No information available.

12.6. Other adverse effects

Product:	**sodium hypochlorite, solution 10-15 % Cl active**	**CAS-No. 7681-52-9**

Additional ecological information

Remarks : All numerical values for ecotoxicity effects are calculated on the pure substances.
Do not flush into surface water or sanitary sewer system.

13. Disposal considerations

13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.

Contaminated packaging : Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. Packagings that cannot be cleaned are to be disposed of in the same manner as the product.

European Waste Catalogue Number : No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

14. Transport information

14.1. UN number

1791

14.2. UN proper shipping name

ADR : HYPOCHLORITE SOLUTION
RID : HYPOCHLORITE SOLUTION
IMDG : HYPOCHLORITE SOLUTION

14.3. Transport hazard class(es)

ADR-Class (Labels; Classification Code; Hazard identification No; Tunnel restriction code)	:	8 8; C9; 80; (E)
RID-Class (Labels; Classification Code; Hazard identification No)	:	8 8; C9; 80
IMDG-Class (Labels; EmS)	:	8 8; F-A, S-B

14.4. Packaging group

ADR	:	III
RID	:	III
IMDG	:	III

14.5. Environmental hazards

Labeling according to 5.2.1.8 ADR	:	Fish and tree
Labeling according to 5.2.1.8 RID	:	Fish and tree
Labeling according to 5.2.1.6.3 IMDG	:	Fish and tree
Classification as environmentally hazardous according to 2.9.3 IMDG	:	yes

14.6. Special precautions for user

Note : not applicable

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

15. Regulatory information

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

15.2. Chemical Safety Assessment

Currently we do not have any Information from our supplier about this.

16. Other information

Full text of R-phrases referred to under sections 2 and 3.

R31	Contact with acids liberates toxic gas.
R34	Causes burns.
R50	Very toxic to aquatic organisms.

Full text of H-Statements referred to under sections 2 and 3.

H314	Causes severe skin burns and eye damage.
H400	Very toxic to aquatic life.

Further information

Other information : Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use.
The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship.
The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text

|| Indicates updated section.

Revision Date 24/05/13

Revision 9

Supersedes date March 2011

SAFETY DATA SHEET
Sodium hydroxide solution, 5 - 51%

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name Sodium hydroxide solution, 5 - 51%

REACH Registration number 01-2119457892-27

CAS-No. 1310-73-2

EC No. 215-185-5

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. Raw material. Neutralising agent. pH regulating agent Manufacture of substances. Absorbant for gases and liquids Manufacturing soaps Washing and cleaning products

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

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

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Met. Corr. 1 - H290
Human health	Skin Corr. 1A - H314;Eye Dam. 1 - H318
Environment	Not classified.

Classification (1999/45/EEC) C;R35.

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

Human health

Corrosive. Prolonged contact causes serious eye and tissue damage.

Environment

Substantial amounts of the product may lead to a local change in acidity in small water systems which may have adverse effects on aquatic organisms.

2.2. Label elements

EC No. 215-185-5

Contains SODIUM HYDROXIDE

Label In Accordance With (EC) No. 1272/2008

Sodium hydroxide solution, 5 - 51%

Signal Word	Danger	
Hazard Statements		
	H290	May be corrosive to metals.
	H314	Causes severe skin burns and eye damage.
	H318	Causes serious eye damage.
Supplementary Precautionary Statements		
	P234	Keep only in original container.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P260	Do not breathe vapour/spray.
	P264	Wash contaminated skin thoroughly after handling.
	P321	Specific treatment (see medical advice on this label).
	P301+330+331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P303+361+353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P304+340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P305+351+338	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.
	P363	Wash contaminated clothing before reuse.
	P390	Absorb spillage to prevent material damage.
	P405	Store locked up.
	P406	Store in corrosive resistant/… container with a resistant inner liner.
	P501	Dispose of contents/container to …

2.3. Other hazards

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

SODIUM HYDROXIDE	**40-60%**
CAS-No.: 1310-73-2 **EC No.: 215-185-5**	
Classification (EC 1272/2008) Met. Corr. 1 - H290 Skin Corr. 1A - H314 Eye Dam. 1 - H318	Classification (67/548/EEC) C;R35

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

REACH Registration number 01-2119457892-27

CAS-No. 1310-73-2

EC No. 215-185-5

Composition Comments

Mercury (Rayon) grade contains a low level of mercury, typically less than 0.1 ppm. Diaphragm grade contains up to 1.3% sodium chloride, which increases the density of the solution.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General information

Get medical attention immediately! CAUTION! First aid personnel must be aware of own risk during rescue!

Inhalation

Rinse nose, mouth, and throat with running water.

Ingestion

Do not induce vomiting. If confined to the mouth, rinse mouth thoroughly and ensure water is not swallowed. If swallowed, drink plenty of water. If substance has been swallowed, give water or milk to drink immediately. Get medical attention immediately!

Skin contact

Remove contaminated clothes and rinse skin thoroughly with water. Get medical attention immediately!

Eye contact

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes.

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

General information

Strong corrosive action on all body tissue, causing burns and frequently deep ulceration, and ultimately scarring.

Inhalation

Mist/droplets are irritating to the respiratory tract, and will cause a burning sensation in the throat, coughing, and breathing difficulties. Pulmonary oedema (excessive liquid in the lungs) can occur after inhalation of higher amounts.

Ingestion

Causes severe damage to gastrointestinal tract. Can cause perforation and scarring.

Skin contact

Burning pain and severe corrosive skin damage. Causes burns, deep ulceration, and scarring. Frequent contact with lower concentrations may cause eczema.

Eye contact

Corrosive to eyes. May cause severe corneal damage, reduced vision, or even blindness.

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

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

Contact with some metals can liberate flammable hydrogen gas.

5.3. Advice for firefighters

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet. In case of spills, beware of slippery floors and surfaces.

6.2. Environmental precautions

Do not discharge into drains, water courses or onto the ground. Contain spillages with sand, earth or any suitable adsorbent material. Release to rivers will cause a strong increase in pH, resulting in death to aquatic organisms. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

Small Spillages: Neutralise with weak acid and wash away with water. Alternately, drench spill with water and wash away. Large Spillages: Isolate and pump into a tank. Dispose of via a licensed hazardous waste contractor. Keep people and animals away from contaminated areas.

6.4. Reference to other sections

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Following prolonged storage in metal tanks, a black sludge will collect at the bottom of the tank. This will contain iron, sodium carbonate, and when Mercury (Rayon) grade is stored, mercury. Test the atmosphere in the tank for oxygen and mercury vapour before entering. Appropriate care must be taken when removing and handling this sludge, including control of atmospheric levels. Handle with care as an alkaline material. Take care when diluting with water (heat generation). Avoid contact with skin and eyes. Avoid generation of sprays or mists.

7.2. Conditions for safe storage, including any incompatibilities

Store in vessels of mild steel. Keep away from acids and other chemicals that react with this product. Build-up of white metal carbonate crystals may occur if tank is open to air.

7.3. Specific end use(s)

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
SODIUM HYDROXIDE	WEL				2 mg/m3	

WEL = Workplace Exposure Limit.

8.2. Exposure controls

Protective equipment

Engineering measures

Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Respiratory equipment

If ventilation is insufficient, suitable respiratory protection must be provided.

Hand protection

Wear protective gloves. Rubber or plastic.

Eye protection

Goggles/face shield are recommended.

Other Protection

Chemical suit and boots if handling large quantities.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Colourless liquid.
Odour	Odourless.
Solubility	Miscible with water
Initial boiling point and boiling range (°C)	142
	For 50% Membrane grade
Melting point (°C)	12
	For 50% Membrane grade
Relative density	1525 20
	For 50% Membrane grade
Viscosity	78 cP 20
	For 50% Membrane grade

9.2. Other information

Sodium hydroxide solution, 5 - 51%

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

10.2. Chemical stability

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid

Vessels should not be open to air; substance absorbs water and carbon dioxide. In extreme cases, the carbonate can form white floating crystals. Do not store adjacent to incompatible materials, such as acids and amphoteric metals eg aluminium, magnesium, zinc, tin and bronze - may release hydrogen gas.

10.5. Incompatible materials

Materials To Avoid

Reaction with ammonium compounds releases ammonia. May react violently with acrolein, acrylnitrice, and allyl alcohol. Heating with trichloroethylene will form explosive mixtures of dichloroacetylene. Some plastics, leather and textiles are destroyed on contact. Mixture with water or acids will release large quantities of heat.

10.6. Hazardous decomposition products

Thermally stable to boiling point; does not decompose. Precipitation of metal hydroxide crystals can occur below 12C.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

General information

Strong corrosive action on all body tissue, causing burns and frequently deep ulceration, with ultimate scarring.

Inhalation

Mist/droplets are corrosive to the respiratory tract, and will cause a burning sensation in the throat, coughing and breathing difficulties. Pulmonary oedema (excessive liquid in lungs) can occur after inhalation of higher amounts.

Ingestion

If ingested will cause severe damage to gastrointestinal tract. Can cause perforation and scarring.

Skin contact

Corrosive to body tissue, causing burns, deep ulceration, and scarring. Frequent contact with lower concentrations may cause eczema.

Eye contact

Vapour or spray may cause eye damage, impaired sight or blindness.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Spillage will cause localised damage to animals and plants on the ground. Do not allow release into controlled waters; resulting high pH will affect aquatic life forms. If allowed to enter drains will damage effluent treatment organisms. Neutralisation and dilution will greatly reduce these effects. Product is chemically degradable into sodium carbonate.

12.1. Toxicity

LC 50, 96 Hrs, Fish mg/l	45.4

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

Sodium hydroxide solution, 5 - 51%

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Neutralise with dilute acid and wash away with large amounts of water. Confirm disposal procedures with environmental engineer and local regulations.

SECTION 14: TRANSPORT INFORMATION

14.1. UN number

UN No. (ADR/RID/ADN) 1824

14.2. UN proper shipping name

Proper Shipping Name SODIUM HYDROXIDE SOLUTION

14.3. Transport hazard class(es)

ADR/RID/ADN Class Class 8: Corrosive substances.

Transport Labels

14.4. Packing group

ADR/RID/ADN Packing group II

IMDG Packing group II

ICAO Packing group II

14.5. Environmental hazards

14.6. Special precautions for user

Hazard No. (ADR) 80

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

SECTION 15: REGULATORY INFORMATION

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

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

General information

The material must only be loaded and unloaded from tankers by trained personnel, such as those with a Hazchem certificate.

Sodium hydroxide solution is used as a chemical for the treatment of drinking water, as approved by the European Committee for Standardisation under EN 896:2005.

This data sheet was prepared in accordance with EC 1907/2006 concerning REACH.

Issued By D.Kelly

Revision Date 24/05/13

Revision 9

Sodium hydroxide solution, 5 - 51%

Supersedes date	March 2011
Risk Phrases In Full	
R35	Causes severe burns.
Hazard Statements In Full	
H318	Causes serious eye damage.
H314	Causes severe skin burns and eye damage.
H290	May be corrosive to metals.

Revision Date 13/08/2015
Revision 18
Supersedes date 15/06/2014

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-No.	10028-22-5
EC No.	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

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

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Met. Corr. 1 - H290
Human health	Acute Tox. 4 - H302;Eye Dam. 1 - H318;STOT SE 3 - H335
Environment	Not classified.

Classification (1999/45/EEC) Xn;R22. C;R34.

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

2.2. Label elements

EC No.	233-072-9
Contains	Ferric sulfate

Label In Accordance With (EC) No. 1272/2008

Ferric sulfate solution 11% - 14%

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		
	P305+351+338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P302+352	IF ON SKIN: Wash with plenty of soap and water.
	P501	Dispose of contents/container in accordance with national regulations.
Supplementary Precautionary Statements		
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P301+312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P304+340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P310	Immediately call a POISON CENTER or doctor/physician.
	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 **40-60%**

CAS-No.: 10028-22-5 **EC No.: 233-072-9** **Registration Number: 01-2119513202-59**

Classification (EC 1272/2008)	Classification (67/548/EEC)
Acute Tox. 4 - H302	Xn;R22.
Skin Irrit. 2 - H315	Xi;R38,R41.
Eye Dam. 1 - H318	

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

REACH Registration number	01-2119513202-59
REACH Registration notes	Registered as the pure (dry) substance
CAS-No.	10028-22-5
EC No.	233-072-9

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed 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. Immediately rinse mouth and drink plenty of water (200-300 ml). If confined to the mouth, rinse mouth thoroughly and ensure water is not swallowed. If swallowed, drink plenty of water.

Skin contact

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

Eye contact

Promptly wash eyes with plenty of water while lifting the eye lids. Obtain medical attention and bring these instructions.

Ferric sulfate solution 11% - 14%

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

Extinguishing media

The product is non-combustible. However NOx will support combustion. Use fire-extinguishing media appropriate for surrounding materials. 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

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

Small Spillages: Flush away small spillages 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

Wear appropriate protective clothing. Avoid contact with skin and eyes. Avoid forming spray/aerosol 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

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 separated from: Store in vessels suitable for substances of low pH. Store away from: Alkalis. Avoid contact with metals (except 316 and 340 stainless steel).

7.3. Specific end use(s)

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
Ferric sulfate			1 mg/m3		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 solution 11% - 14%

8.2. Exposure controls

Respiratory equipment

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.

Hand protection

PVC or rubber gloves are recommended.

Eye protection

Goggles/face shield are recommended.

Other Protection

Plastic apron, sleeves, boots - if handling large quantities, full body suit.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Liquid
Colour	Brown.
Solubility	(Of nitric oxide) 46ml/l at 20'C (62g/ton of water)
Initial boiling point and boiling range (°C)	~120'C
Melting point (°C)	< -20'C
Relative density	1.45 - 1.65 20
Vapour density (air=1)	1.04 (nitric oxide) & 1.58 (nitrogen dioxide)
pH-Value, Conc. Solution	0.5 - 1.0
Viscosity	45 cP 20'C
	90 cps at 5'C

9.2. Other information

SECTION 10: STABILITY AND REACTIVITY

10.1. 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

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

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

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

Toxic Dose 1 - LD 50

2100 mg/kg (oral rat)

Acute toxicity:

Ferric sulfate solution 11% - 14%

Acute Toxicity (Dermal LD50)

2000 mg/kg 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. Risk of 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

EC50 48 hours 11 mg/l Freshwater invertebrates

Chronic Toxicity - Aquatic Invertebrates

EC50 21 days 4.5 mg/l Freshwater invertebrates

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

Small amounts can be neutralised with lime or caustic soda, and washed away with copious amounts of water. Small amounts may be flushed with water to sewer. Larger volumes must be sent to approved plant for destruction. Dispose of waste and residues in accordance with local authority requirements. Do not dispose directly into rivers or drains

SECTION 14: TRANSPORT INFORMATION

14.1. UN number

UN No. (ADR/RID/ADN)	1760
UN No. (IMDG)	1760
UN No. (ICAO)	1760

Ferric sulfate solution 11% - 14%

14.2. UN proper shipping name

Proper Shipping Name	CORROSIVE LIQUID, N.O.S. (Ferric sulfate solution).
Proper Shipping Name	CORROSIVE LIQUID, N.O.S.

14.3. Transport hazard class(es)

ADR/RID/ADN Class	8
ADR/RID/ADN Class	Class 8: Corrosive substances.
ADR Label No.	8
IMDG Class	8
ICAO Class/Division	8

Transport Labels

14.4. Packing group

ADR/RID/ADN Packing group	III
IMDG Packing group	III
ICAO Packing group	III

14.5. Environmental hazards

14.6. Special precautions for user

EMS	F-A, S-B
Emergency Action Code	2X
Hazard No. (ADR)	80
Hazard No. (ADR)	80 Corrosive or slightly corrosive substance.
Tunnel Restriction Code	(E)

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

SECTION 15: REGULATORY INFORMATION

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

Uk Regulatory References

The Control of Substances Hazardous to Health Regulations 2002 (S.I 2002 No. 2677) with amendments.

Guidance Notes

Workplace Exposure Limits EH40.

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), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

15.2. Chemical Safety Assessment

A chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

Ferric sulfate solution 11% - 14%

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

Updated hazard phrases.

Issued By	Chief Chemist
Revision Date	13/08/2015
Revision	18
Supersedes date	15/06/2014

Risk Phrases In Full

R34	Causes burns.
R22	Harmful if swallowed.
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.

Singleton Birch

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REACH Regulation EC 1907/2006,

Regulation (EC) 1272/2008 and Regulation (EC) 453/2010

1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1 Product identifier

Substance name:	Hydrated lime, Calcium dihydroxide
Synonyms:	Slaked lime, Air slaked lime, Building lime, Fat lime, Chemical lime, Finishing lime, Mason's lime, Calcium dihydroxide, Calcium hydroxide, Calcium hydrate, Lime, Lime water
Chemical name and formula:	Calcium dihydroxide – $Ca(OH)_2$
Trade name:	Ultralime® Hydrated Lime
CAS:	1305-62-0
EINECS:	215-137-3
Molecular Weight:	74.09 g/mol
REACH Registration number:	01-2119475151-45-0019

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

Please check the identified uses in table 1 of the Appendix of this SDS.

Uses advise against:	There are no uses advised against.

1.3 Details of the supplier of the safety data sheet

Name:	Singleton Birch Limited
Address:	Melton Ross Quarries, Barnetby, North Lincolnshire DN38 6AE
Phone N°:	+44(0)1652 686000
Fax N°:	+44(0)1652 686081
E-mail of competent person responsible for SDS in the MS or in the EU:	kb@singletonbirch.co.uk; jt@singletonbirch.co.uk

1.4 Emergency telephone number

European Emergency N°:	112
National centre for Prevention & Treatment of Intoxications N°:	National Chemicals Emergency Centre (NCEC) +44 (0) 870 190 6621
Emergency telephone at the company	+44(0)1652 686000 (24 hours)
Available outside office hours:	Yes

2 HAZARDS IDENTIFICATION

2.1 Classification of the substance

2.1.1 Classification according to Regulation (EC) 1272/2008

STOT Single Exp. 3, Route of exposure: Inhalation
Skin Irritation 2
Eye Damage 1

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2.1.2 Classification according to Directive 67/548/EEC

Xi – irritant

2.2 Label elements

2.2.1 Labelling according to Regulation (EC) 1272/2008

Signal word: Danger

Hazard pictogram:

Hazard statements:

H315:	Causes skin irritation
H318:	Causes serious eye damage
H335:	May cause respiratory irritation

Precautionary statements:

P102:	Keep out of reach of children
P280:	Wear protective gloves/protective clothing/eye protection/face protection
P305+P351+P310:	IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTRE or doctor/physician
P302+P352:	IF ON SKIN: Wash with plenty of water
P261:	Avoid breathing dust/spray
P304+P340:	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P501:	Dispose of contents/container in accordance with local, regional, national and international regulation – use a registered hazardous waste carrier/licence holder, and/or contact the manufacturer

2.2.2 Labelling according to Directive 67/548/EEC

Indication of danger: Xi irritant

Hazard pictogram:

Risk phrases:

R37:	Irritating to respiratory system
R38:	Irritating to skin
R41:	Risk of serious damage to eyes

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Safety phrases:

S2: Keep out of the reach of children
S25: Avoid contact with eyes
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37: Wear suitable gloves
S39: Wear eye/face protection

2.3 Other hazards

The substance does not meet the criteria for PBT or vPvB substance.
No other hazards identified.

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Main constituent

Name:	Calcium dihydroxide
CAS:	1305-62-0
EINECS:	215-137-3

Impurities

No impurities relevant for classification and labelling.

4 FIRST AID MEASURES

4.1 Description of first aid measures

General advice

No known delayed effects. Consult a physician for all exposures except for minor instances.

Following inhalation

Move source of dust or move person to fresh air. Obtain medical attention immediately.

Following skin contact

Carefully and gently brush the contaminated body surfaces in order to remove all traces of product. Wash affected area immediately with plenty of water. Remove contaminated clothing. If necessary seek medical advice.

Following eye contact

Rinse eyes immediately with plenty of water and seek medical advice.

Following ingestion

Clean mouth with water and drink afterwards plenty of water. Do **NOT** induce vomiting. Obtain medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Calcium dihydroxide is not acutely toxic via the oral, dermal, or inhalation route. The substance is classified as irritating to skin and the respiratory tract, and entails a risk of serious damage to the eye. There is no concern for adverse systemic effects because local effects (pH-effect) are the major health hazard.

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4.3 Indication of any immediate medical attention and special treatment needed
Follow the advises given in section 4.1

5 FIREFIGHTING MEASURES

5.1 Extinguishing media

5.1.1 Suitable extinguishing media
Suitable extinguishing media: The product is not combustible. Use a dry powder, foam or CO_2 fire extinguisher to extinguish the surrounding fire. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.1.2 Unsuitable extinguishing media
Do not use water

5.2 Special hazards arising from the substance or mixture
None

5.3 Advice for fire fighters
Avoid generation of dust. Use breathing apparatus. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel
Ensure adequate ventilation.
Keep dust levels to a minimum.
Keep unprotected persons away.
Avoid contact with skin, eyes, and clothing – wear suitable protective equipment (see section 8).
Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8)

6.1.2 For emergency responders
Keep dust levels to a minimum.
Ensure adequate ventilation.
Keep unprotected persons away.
Avoid contact with skin, eyes, and clothing – wear suitable protective equipment (see section 8).
Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8)

6.2 Environmental precautions
Contain the spillage. Keep the material dry if possible. Cover area if possible to avoid unnecessary dust hazard. Avoid uncontrolled spills to watercourses and drains (pH increase). Any large spillage into watercourses must be alerted to the Environment Agency or other regulatory body.

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6.3 Methods and material for containment and cleaning up

In all cases avoid dust formation.
Keep the material dry if possible.
Pick up the product mechanically in a dry way.
Use vacuum suction unit, or shovel into bags.

6.4 Reference to other sections

For more information on exposure controls/personal protection or disposal considerations, please check section 8 and 13 and the Annex of this safety data sheet.

7 HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures

Avoid contact with skin and eyes. Wear protective equipment (refer to section 8 of this safety data sheet). Do not wear contact lenses when handling this product. It is also advisable to have individual pocket eyewash. Keep dust levels to a minimum. Minimize dust generation. Enclose dust sources, use exhaust ventilation (dust collector at handling points). Handling systems should preferably be enclosed. When handling bags usual precautions should be paid to the risks outlined in the Council Directive 90/269/EEC.

7.1.2 Advice on general occupational hygiene

Avoid inhalation or ingestion and contact with skin and eyes. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no drinking, eating and smoking at the workplace. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibilities

The substance should be stored under dry conditions. Any contact with air and moisture should be avoided. Bulk storage should be in purpose – designed silos. Keep away from acids, significant quantities of paper, straw, and nitro compounds. Keep out of reach of children. Do not use aluminium for transport or storage if there is a risk of contact with water.

7.3 Specific end use(s)

Please check the identified uses in table 1 of the Appendix of this SDS.
For more information please see the relevant exposure scenario, available via your supplier/given in the Appendix, and check section 2.1: Control of worker exposure.

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8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

SCOEL recommendation (SCOEL/SUM/137 February 2008; see Section 16.6):
Workplace Exposure Limit (WEL), 8 h TWA: 5 mg/m³
Occupational Exposure Limit (OEL), 8h TWA: 1 mg/m³ respirable dust of calcium oxide
Short-term exposure limit (STEL), 15 min: 4 mg/m³ respirable dust of calcium oxide
PNEC aqua = 490 µg/l
PNEC soil/groundwater = 1080 mg/l

8.2 Exposure controls

To control potential exposures, generation of dust should be avoided. Further, appropriate protective equipment is recommended. Eye protection equipment (e.g. goggles or visors) must be worn, unless potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.
Please check the relevant exposure scenario, given in the Appendix/available via your supplier.

8.2.1 Appropriate engineering controls

If user operations generate dust, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne dust levels below recommended exposure limits.

8.2.2 Individual protection measures, such as personal protective equipment

8.2.2.1 Eye/face protection

Do not wear contact lenses. For powders, tight fitting goggles with side shields, or wide vision full goggles. It is also advisable to have individual pocket eyewash.

8.2.2.2 Skin protection

Since calcium dihydroxide is classified as irritating to skin, dermal exposure has to be minimised as far as technically feasible. The use of protective gloves (nitrile), protective standard working clothes fully covering skin, full length trousers, long sleeved overalls, with close fittings at openings and shoes resistant to caustics and avoiding dust penetration are required to be worn.

8.2.2.3 Respiratory protection

Local ventilation to keep levels below established threshold values is recommended. A suitable particle filter mask is recommended, depending on the expected exposure levels - please check the relevant exposure scenario, given in the Appendix/available via your supplier.

8.2.2.4 Thermal hazards

The substance does not represent a thermal hazard, thus special consideration is not required.

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8.2.3 Environmental exposure controls

All ventilation systems should be filtered before discharge to atmosphere.
Avoid releasing to the environment.
Contain the spillage. Any large spillage into watercourses must be alerted to the regulatory authority responsible for environmental protection or other regulatory body.
For detailed explanations of the risk management measures that adequately control exposure of the environment to the substance please check the relevant exposure scenario, available via your supplier.
For further detailed information, please check the Appendix of this SDS.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	White or off white (beige) fine powder
Odour:	odourless
Odour threshold:	not applicable
pH:	12.4 (saturated solution at 20 °C)
Melting point:	> 450 °C (study result, EU A.1 method)
Boiling point:	not applicable (solid with a melting point > 450 °C)
Flash point:	not applicable (solid with a melting point > 450 °C)
Evaporation rate:	not applicable (solid with a melting point > 450 °C)
Flammability:	non flammable (study result, EU A.10 method)
Explosive limits:	non explosive (void of any chemical structures commonly associated with explosive properties)
Vapour pressure:	not applicable (solid with a melting point > 450 °C)
Vapour density:	not applicable
Relative density:	2.24 (study result, EU A.3 method)
Solubility in water:	1844.9 mg/L (study results, EU A.6 method)
Partition coefficient:	not applicable (inorganic substance)
Auto ignition temperature:	no relative self-ignition temperature below 400 °C (study result, EU A.16 method)
Decomposition temperature:	When heated above 580°C, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H_2O)
Viscosity:	not applicable (solid with a melting point > 450 °C)
Oxidising properties:	no oxidising properties (Based on the chemical structure, the substance does not contain a surplus of oxygen or any structural groups known to be correlated with a tendency to react exothermally with combustible material)

9.2 Other information

Not available

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10 STABILITY AND REACTIVITY

10.1 Reactivity

In aqueous media $Ca(OH)_2$ dissociates resulting in the formation of calcium cations and hydroxyl anions (when below the limit of water solubility).

10.2 Chemical stability

Under normal conditions of use and storage, calcium dihydroxide is stable.

10.3 Possibility of hazardous reactions

Calcium dihydroxide reacts exothermically with acids. When heated above 580 °C, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H2O): Ca(OH)2→CaO + H2O. Calcium oxide reacts with water and generates heat. This may cause risk to flammable material.

10.4 Conditions to avoid

Minimise exposure to air and moisture to avoid degradation.

10.5 Incompatible materials

Calcium dihydroxide reacts exothermically with acids to form salts. Calcium dihydroxide reacts with aluminium and brass in the presence of moisture leading to the production of hydrogen.

$Ca(OH)_2 + 2\ Al + 6\ H_2O \rightarrow Ca[Al(OH)_4]_2 + 3\ H_2$

10.6 Hazardous decomposition products

None

Further information: calcium dihydroxide reacts with carbon dioxide to form calcium carbonate, which is a common material in nature.

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Calcium dihydroxide is classified as irritating to skin and the respiratory tract and it entails a risk of serious damage to the eye. The occupational exposure limit for the prevention of local sensory irritation and decrease of lung function parameters as critical effects is OEL (8 h) = 1 mg/m³ respirable dust.

Toxicity endpoints	Outcome of the effects assessment
Absorption	The primary health effect of calcium dihydroxide is local irritation due to a pH shift. Therefore, absorption is not a relevant parameter for the effects assessment.

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Established 1815

Toxicity endpoints	Outcome of the effects assessment
Acute toxicity	Calcium dihydroxide is not acutely toxic. Oral LD_{50}> 2000 mg/kg bw (OECD 425, rat) Dermal LD_{50}> 2500 mg/kg bw (calcium dihydroxide, OECD 402, rabbit) Inhalation no data available Classification for acute toxicity is not warranted. For irritating effects to the respiratory tract see below.
Irritation / corrosion	Eye Irritation: Calcium dihydroxide entails a risk of serious damage to the eye (eye irritation studies (*in vivo*, rabbit). Skin Irritation: Calcium dihydroxide is irritating to skin (*in vivo*, rabbit). Respiratory Irritation: From human data it is concluded that $Ca(OH)_2$ is irritating to the respiratory tract. Based on experimental results, calcium dihydroxide requires classification as irritating to skin [R38, irritating to skin; Skin Irrit 2 (H315 – Causes skin irritation)] and as severely irritating to the eye [R41, Risk of serious damage to eye; Eye Damage 1 (H318 - Causes serious eye damage)]. As summarised and evaluated in the SCOEL recommendation (Anonymous, 2008), based on human data calcium dihydroxide is classified as irritating to the respiratory system [R37, Irritating to respiratory system; STOT SE 3 (H335 – May cause respiratory irritation)].
Sensitisation	No data available. Calcium dihydroxide is considered not to be a skin sensitiser, based on the nature of the effect (pH shift) and the essential requirement of calcium for human nutrition. Classification for sensitisation is not warranted.
Repeated dose toxicity	Toxicity of calcium via the oral route is addressed by upper intake levels (UL) for adults determined by the Scientific Committee on Food (SCF), being UL = 2500 mg/d, corresponding to 36 mg/kg bw/d (70 kg person) for calcium. Toxicity of $Ca(OH)_2$ via the dermal route is not considered as relevant in view of the anticipated insignificant absorption through skin and due to local irritation as the primary health effect (pH shift). Toxicity of $Ca(OH)_2$ via inhalation (local effect, irritation of mucous membranes) is addressed by an 8-h TWA determined by the Scientific Committee on Occupational Exposure Limits (SCOEL) of 1 mg/m³ respirable dust (see Section 8.1). Therefore, classification of $Ca(OH)_2$ for toxicity upon prolonged exposure is not required.
Mutagenicity	Bacterial reverse mutation assay (Ames test, OECD 471): Negative In view of the omnipresence and essentiality of Ca and of the physiological non-relevance of any pH shift induced by lime in aqueous media, lime is obviously void of any genotoxic potential. Classification for genotoxicity is not warranted.

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Toxicity endpoints	Outcome of the effects assessment
Carcinogenicity	Calcium (administered as Ca-lactate) is not carcinogenic (experimental result, rat). The pH effect of calcium oxide does not give rise to a carcinogenic risk. Human epidemiological data support lack of any carcinogenic potential of calcium oxide. Classification for carcinogenicity is not warranted.
Toxicity for reproduction	Calcium (administered as Ca-carbonate) is not toxic to reproduction (experimental result, mouse). The pH effect does not give rise to a reproductive risk. Human epidemiological data support lack of any potential for reproductive toxicity of calcium dihydroxide. Both in animal studies and human clinical studies on various calcium salts no reproductive or developmental effects were detected. Also see the Scientific Committee on Food (Section 16.6). Thus, calcium dihydroxide is not toxic for reproduction and/or development. Classification for reproductive toxicity according to regulation (EC) 1272/2008 is not required.

12 ECOLOGICAL INFORMATION

12.1 Toxicity

12.1.1 Acute/Prolonged toxicity to fish

LC_{50} (96h) for freshwater fish: 50.6 mg/l
LC_{50} (96h) for marine water fish: 457 mg/l

12.1.2 Acute/Prolonged toxicity to aquatic invertebrates

EC_{50} (48h) for freshwater invertebrates: 49.1 mg/l
LC_{50} (96h) for marine water invertebrates: 158 mg/l

12.1.3 Acute/Prolonged toxicity to aquatic plants

EC_{50} (72h) for freshwater algae: 184.57 mg/l
NOEC (72h) for freshwater algae: 48 mg/l

12.1.4 Toxicity to micro-organisms e.g. bacteria

At high concentration, through the rise of temperature and pH, calcium dihydroxide is used for disinfection of sewage sludges

12.1.5 Chronic toxicity to aquatic organisms

NOEC (14d) for marine water invertebrates: 32 mg/l

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12.1.6 Toxicity to soil dwelling organisms
EC_{10}/LC_{10} or NOEC for soil macro organisms: 2000 mg/kg soil dw
EC_{10}/LC_{10} or NOEC for soil micro organisms: 12000 mg/kg soil dw

12.1.7 Toxicity to terrestrial plants
NOEC (21d) for terrestrial plants: 1080 mg/kg

12.1.8 General effect
Acute pH-effect. Although this product is useful to correct water acidity, an excess of more than 1 g/l may be harmful to aquatic life. pH-value of > 12 will rapidly decrease as result of dilution and carbonation

12.2 Persistence and degradability
Not relevant for inorganic substances

12.3 Bioaccumulative potential
Not relevant for inorganic substances

12.4 Mobility in soil
Calcium dihydroxide which is sparingly soluble, and present a low mobility in most soils

12.5 Results of PBT and vPvB assessment
Not relevant for inorganic substances

12.6 Other adverse effects
No other adverse effects are identified

13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Disposal of calcium dihydroxide should be in accordance with local and national legislation.
Processing, use or contamination of this product may change the waste management options.
Dispose of container and unused contents in accordance with applicable member state and local requirements.
The used packing is only meant for packing this product; it should not be reused for other purposes.
After usage, empty the packing completely.

14 TRANSPORT INFORMATION

Calcium dihydroxide is not classified as hazardous for transport (ADR (Road), RID (Rail), IMDG / GGVSea (Sea).

14.1 UN-Number
Not regulated

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14.2 UN proper shipping name
Not regulated

14.3 Transport hazard class
Not regulated

14.4 Packing group
Not regulated

14.5 Environmental hazards
None

14.6 Special precautions for user
Avoid any release of dust during transportation, by using air-tight tanks

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not regulated.

15 REGULATORY INFORMATION

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

Authorisations:	Not required
Restrictions on use:	None
Other EU regulations:	Calcium dihydroxide is not a SEVESO substance, not an ozone depleting substance and not a persistent organic pollutant.
National regulations:	Water endangering class 1 (Germany)

15.2 Chemical safety assessment
A chemical safety assessment has been carried out for this substance.

16 OTHER INFORMATION

Data are based on our latest knowledge but do not constitute a guarantee for any specific product features and do not establish a legally valid contractual relationship.

16.1 Hazard Statements
H315: Causes skin irritation
H318: Causes serious eye damage
H335: May cause respiratory irritation

16.2 Precautionary Statements

P102:	Keep out of reach of children
P280:	Wear protective gloves/protective clothing/eye protection/face protection
P305+P351:	IF IN EYES: Rinse cautiously with water for several minutes
P310:	Immediately call a POISON CENTRE or doctor/physician

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P302+P352: IF ON SKIN: Wash with plenty of soap and water
P261: Avoid breathing dust/fume/gas/mist/vapours/spray
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P501: Dispose of contents/container in accordance with local/regional/national/international regulation - use a registered hazardous waste carrier/licence holder, and/or contact the manufacturer

16.3 Risk Phrases
R37: Irritating to respiratory system
R38: Irritating to skin
R41: Risk of serious damage to eyes

16.4 Safety Phrases
S2: Keep out of the reach of children
S25: Avoid contact with eyes
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37: Wear suitable gloves
S39: Wear eye/face protection

16.5 Abbreviations
EC_{50}: median effective concentration
LC_{50}: median lethal concentration
LD_{50}: median lethal dose
NOEC: no observable effect concentration
WEL: workplace exposure limit
OEL: occupational exposure limit
PBT: persistent, bioaccumulative, toxic chemical
PNEC: predicted no-effect concentration
STEL: short-term exposure limit
TWA: time weighted average
vPvB: very persistent, very bioaccumulative chemical
EULA: European Lime Association

16.6 Key literature references
Anonymous, 2006: Tolerable upper intake levels for vitamins and minerals Scientific Committee on Food, European Food Safety Authority, ISBN: 92-9199-014-0 [SCF document]
Anonymous, 2008: Recommendation from the Scientific Committee on Occupational Exposure Limits (SCOEL) for calcium oxide (CaO) and calcium dihydroxide ($Ca(OH)_2$), European Commission, DG Employment, Social Affairs and Equal Opportunities, SCOEL/SUM/137 February 2008

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16.7 Revision

SDS revised in accordance with EULA SDS format

Disclaimer

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation (EC 1907/2006; article 31 and Annex II), as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is the responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current state of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guarantee of technical performance, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS supersedes all previous versions.

ANNEX

Addition of exposure Scenarios as applicable - Please see Appendix SD30A SDS – Hydrate Lime Range.

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Unit 9
Greatbridge Business Park
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Romsey
Hampshire
SO51 0HA

Material Safety Data Sheet – Cut Grass Deodoriser

1. Identification of the Substance & Company

Company:	Cobra Hydro Limited
Product:	Cut Grass Deodoriser
Product Type:	Deodoriser

2. Composition/Information on ingredients

Hazardous component:	Cas No.	Index	Risk Phrases:	Concentration:
Non Ionic Surfactant		Xi	R36/38	<5%
Amyl acetate		F+	R11	<10%

3. Hazard Identification

Not classified as Hazardous under CHIP regulations.

4. First-aid measures

Eye Contact:	Flush with plenty of clean water for at least 15 minutes. If irritation persists, obtain medical attention.
Skin Contact:	Wash off with Water. The application of skin reconditioning (emollient) cream, can be beneficial.
Inhalation:	N/a.
Ingestion:	Milk or water to drink may be beneficial. Do not induce vomiting without medical advice.

5. Fire-fighting measures

Flammability:	Not classed as flammable.
Extinguishing Media:	Foam, Dry Powder, Co2, Halon, fine water spray suitable.
Protective Equipment:	Standard protective equipment.

6. Accidental release measures

Wear gloves/eye protection. Do not allow product to soak into drains or water courses. Soak liquid in absorbent material and collect solids in a container. Wash down floor area as spillages can be slippery**.**

7. Handling and Storage

Storage Precautions:	Store between 0-35ºC. Keep in tightly closed containers. Protect from frost.
Handling:	Avoid contact with skin and eyes. Observe good standards of industrial hygiene.

8. Exposure controls/personal protection

Respiratory Protection:	Unlikely to be necessary where adequate ventilation is provided.
Eyes:	Chemical eye goggles should be worn.
Hand:	PVC or rubber gloves are recommended.
Skin:	Use protective clothing. Remove contaminated clothing and wash with soap and water.

9. Physical and chemical properties

Appearance:	Blue/Green Fluid
Specific Gravity @ 20ºc:	1.00 typical
Odour:	Perfumed
pH Neat:	8.5 typical
pH @ 5% in tap water:	7.50 typical
Boiling Point:	100ºc
Freezing Point:	0ºc
Vapour Pressure:	Water=18mm Hg
Water Solubility:	Totally soluble

10. Stability and reactivity

Stability:	Stable under normal conditions.
Hazardous Decomposition:	Oxides of carbon, nitrogen, water vapour and unidentified compounds, some of which could be toxic may be evolved.
Conditions to Avoid:	Naked flames, hot surfaces, other high temperature sources.

11. Toxicological information

Eyes:	Not classified as an eye irritant. However contact with the undiluted product is likely to cause irritation and stinging.
Skin:	Not classified as a skin irritant. Brief or occasional contact is unlikely to cause any `significant reaction. Prolonged or repeated contact with the undiluted product may lead to de-fatting of the skin and/or slight irritation.
Inhalation:	Unlikely to present any significant hazard at ambient temperature. Excessive exposure to mists caused by atomising systems may cause irritation to eyes and respiratory tract.
Ingestion:	Low order of acute toxicity. Ingestion of this product is not regarded as a significant health hazard, likely to arise in normal use.

12. Ecological information

There is no data available on the product itself.
The components of the product exhibit good to moderate biodegradeability and readily broken down by sewage treatment plants. They are not expected to bio-accumulate.

13. Disposal considerations

Product should be disposed of via an authorised waste disposal contractor in accordance with all local and national regulations.

Wash out containers with water, running the washings to sewage treatment plant system. Dispose of empty containers in accordance with local and national regulations.
Advice can be obtained from the Waste Regulation Authority whether special waste regulations apply to this product.

14. Transport Information

Not classified as dangerous goods

15. Regulatory Information

Label for Supply:	Not Classified.	
Risk Phrases:	Non	
Safety Phrases:	S2:	Keep out of reach of children.
	S24/25:	Avoid contact with skin and eyes.

16. Other information

Do not mix with other chemicals.
The information provided in this data sheet has been compiled in accordance with the requirements of the Chemicals (Hazard information and packaging) Regulations, Directive 93/112/EC.
This data sheet does not constitute an assessment of the workplace risks as required under the provisions of the Health & Safety at Work act and the Control of Substances Hazardous to Health (COSHH).

Legal Disclaimer:

The information supplied above is based upon the present state of our knowledge of the product at the time of publication. It is given in good faith and no warranty is implied with respect to the specification or quality of the product. The user must satisfy himself that the product is entirely suitable for his purpose.

Date 23.11.15

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Material Safety Data Sheet – Oxi-Max

1. Material Identification and Use

Company: Cobra Hydro Limited
Product Name: Oxi-Max
Product Use: Odour and Gas Neutralizer
Chemical Name: Compound
Chemical Family: Compound
Chemical Formula: Compound
Molecular Weight: Not applicable
Synonyms: None

2. Hazardous Ingredients

Component	C.A.S No.	%	TLV ppm	LC50 (RAT) g/m3	LD50 (Oral Rat) mg/kg
Natural Extracts & Synthesis Products compound as odor control	Not assigned	60-90	Not Est.	Not available	Not available
Propanediol	57-55-6	01.-0.5	Not Est.	Not available	Not available
Sodium Bisulphate	7681-38-1	0.1-0.2	Not Est.	Not available	Not available
Emulsifiers	Not assigned	0.5-1.5	Not est.	Not available	Not available

3. Physical Data

Physical State: Liquid
Odour and Appearance: Characteristic spicy fragrant aromatic odor ; copper-orange , clear
Odour Threshold (ppm): Not available
Specific Gravity(water=1): 0.960 ± 0.001
Vapour Pressure (mm): Not available
Vapour Density (air=1): Not available
Evaporation Rate(water=1): > 1
Solubility in Water: soluble
Boiling Point(°C): 84°C
Freezing Point(°C): May crystallize at lower temperatures
% Volatile (by weight): Not available
pH: 4.1
Density (g/ml): 0.960 ± 0.001
Coefficient of Water/Oil Distribution: Not available

4. Fire and Explosive Hazards of Material

Flammability:	Combustible
If Yes, Under What Conditions:	High heat, open flames
Means of Extinction:	Foam, dry chemical, carbon dioxide, water fog.
Special Procedures:	Wear self-contained breathing apparatus and full protective gear for all indoor fires. Flash Point and Method: 69°C ; Closed Cup
Hazardous Combustion Products:	Carbon dioxide, Carbon monoxide, smoke, various hydrocarbons, unidentified organic compounds.
Upper Explosive Limits:	Not available
Lower Explosive Limits:	Not available
Autoignition Temperature:	Not available
Explosive Data Sensitivity to Chemical Impact:	Not available
Rate of Burning:	Not available
Explosive Power:	Not available
Sensitivity to Static Discharge:	Not available

5. Reactivity Data

Chemical Stability:	Stable
Conditions to Avoid:	High heat, open flames
Hazardous Polymerization:	Will not occur.
Incompatibility to Other Substances:	none
Reactivity and Under What Conditions:	Strong alkalies and acids catalyze an aldol-type condensation with glutaraldehyde.
Hazardous Decomposition Products:	Thermal combustion can produce carbon dioxide, carbon monoxide, smoke, various hydrocarbons and unidentified organic compounds.

6. Health Hazards

Routes of Entry:

Skin Contact	: Yes	Skin Absorption	: No	Eye Contact: Yes
Inhalation	: Yes	Ingestion	: Yes	

Effects of Acute Exposure:

Eyes:	Contact can cause severe irritation, redness.
Skin:	Contact may cause irritation, itching with mild redness and possible swelling.
Inhalation:	Excessive breathing of high concentrations may cause nasal and respiratory irritation, stinging sensation in nose and throat, nasal discharge, coughing.
Ingestion:	Can cause gastrointestinal irritation, nausea, vomiting, diarrhea.

Effects of Chronic Overexposure:

Skin:	Excessive exposures may cause allergic contact dermatitis in some individuals.
Inhalation:	Excessive exposures to high concentrations may cause nasal and respiratory irritation, coughing, stinging sensation in nose and throat, nasal discharge.
LC50 of Material:	Not available
LD50 of Material:	Not available
Exposure Limits of Material:	Not available
Irritancy of Material:	Skin and eye irritant. May cause skin sensitization.

Additional Toxicity Data of Components

Toxicological Findings:

Carcinogens, Mutagens or Teratogens: None known

Additional Toxicity Data of Components

Toxicological Findings:

Carcinogens, Mutagens or Teratogens: None known

7. Preventative Measures

Personal Protection Information:

Gloves: Chemical resistant.

Respiratory: Not normally required. NIOSH/MSHA approved respirator if workplace limits are exceeded.

Eye: Safety glasses.

Personal Protection Information : (Cont.)

Clothing: No special requirements. Cover exposed skin.

Footwear: No special requirements.

Other: Eye wash and safety shower.

Engineering Controls: General mechanical ventilation is adequate. If misting conditions prevail or material is used in a confined space, local ventilation is preferred.

Leak and Spill Procedures:

Contain spill. Remove ignition sources. Ventilate area.
Small spills-Absorb onto suitable absorbent and scoop or shovel into suitable container for disposal.
Large spills-Pump material into suitable container for reuse or disposal. Absorb remaining material onto inert absorbent and place in appropriate container for disposal.

Waste Disposal:

Dispose of in accordance with all applicable laws and regulations.

8. First Aid Measures:

Eyes: Immediately flush with water for 15 minutes while holding eyelids open. Get medical attention.

Skin: Remove contaminated clothing. Wash affected area with soap and water for at least 15 minutes. If irritation persists, get medical attention. Launder clothing before reuse.

Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention if symptoms persist.

Ingestion: Do not induce vomiting. Rinse mouth with large amounts of water. Give 1-2 glasses of water or milk to dilute stomach contents. Get immediate medical attention.

Handling Storage:

Avoid contact with eyes and skin. Wash thoroughly after handling.
Keep away from heat and open flames. Keep from freezing. Store at temperatures between 10^{o}C and 30^{o}C (50^{o}F and 86^{o}F).
Store in a cool, dry area where risk of damage is minimized.
Keep container closed when not in use.

9. Regularity Classification:

DOMESTIC SUBSTANCES LIST (DSL): All ingredients are listed on the DSL.
TSCA: All ingredients are on the TSCA existing chemical inventory.

REGULATORY CLASSIFICATIONS (Cont.)

W.H.M.I.S. CLASSIFICATION: B-3
H.M.I.S. RATING: H-0 F-1 R-0

SHIPPING INFORMATION:
Shipping Name : Not Regulated
Class :
UN Number :
Packing Group :

Special Shipping Information: None

10. Preparation Information:

DISCLAIMER:

The information supplied is presented in good faith and has been derived from sources believed to be reliable. However, the data is presented without warranty, expressed or implied, regarding its correctness or accuracy. Since the conditions for use, handling, storage and disposal of this product are beyond our control, it is the responsibility of the user both to determine safe conditions for use of this product and to assume liability for loss, damage or expense arising out of the product's improper use. No warranty expressed or implied regarding the product described herein shall be created by or inferred from any statement or omission in this MSDS. Various government agencies may have specific regulations concerning the transportation, handling, storage, use or disposal of this product which may not be reflected in this MSDS. The user should review these regulations to ensure full compliance.