SAFETY DATA SHEET

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

1.1. Product identifier

Name of the substance	Diesel Fuels and Gas Oils - All Grades (Refer to Synonyms for Product Name)
Identification number	649-224-00-6 (Index number)
Registration number	01-2119484664-27-0052
Synonyms	Ultra Low Sulfur Diesel, FAME Free * Ultra Low Sulfur Diesel, up to 7% FAME * Ultra Low Sulphur Gas Oil , Unmarked - FAME Free * High Sulfur Diesel * GTL Diesel * Unfinished Diesel
SDS number	2004
Issue date	29-July-2011
Version number	06
Revision date	09-May-2014
Supersedes date	09-September-2013

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

Identified uses	Distribution of a substance. Formulation & (re) packaging of substances and mixtures. Manufacture of substance. Use as a Fuel. Use as an intermediate.
Uses advised against	None known.

1.3. Details of the supplier of the safety data sheet

Supplier

Company name	Dove Fuels Ltd
Address	30 Bridge Cross Road Burntwood, Staffordshire WS7 2BY
Telephone	01543 670677

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

Classification	Carc. Cat. 3;R40, Xn;R20-65, Xi;R38, N;R51/53

The full text for all R-phrases is displayed in section 16.

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

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

Hazard summary

Physical hazards	Not classified for physical hazards.
Health hazards	Harmful by inhalation. Irritating to skin. Limited evidence of a carcinogenic effect. Harmful: may cause lung damage if swallowed.
Environmental hazards	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Specific hazards	Breathing of high vapour concentrations may cause dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness. Prolonged or repeated contact with skin may cause redness, itching, irritation, eczema/chapping and oil acne. Components of the product may be absorbed into the body through the skin. Prolonged and repeated contact with the product may cause skin cancer.
Main symptoms	Irritation of eyes and mucous membranes. Skin irritation. Defatting of the skin. Dermatitis. Ingestion may cause irritation and malaise.

2.2. Label elements

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

Contains:	Fuels, diesel
Identification number	649-224-00-6
Hazard pictograms	
Signal word	Danger
Hazard statements	H373 - May cause damage to organs () through prolonged or repeated exposure. H411 - Toxic to aquatic life with long lasting effects. H332 - Harmful if inhaled. H304 - May be fatal if swallowed and enters airways. H351 - Suspected of causing cancer. H226 - Flammable liquid and vapour. H315 - Causes skin irritation.

Precautionary statements

Prevention	P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P280 - Wear protective gloves/protective clothing/eye protection/face protection. P260 - Do not breathe dust/fume/gas/mist/vapors/spray.
Response	P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician. P331 - Do NOT induce vomiting.
Storage	P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
Disposal	P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.
Supplemental label information	None known.
2.3. Other hazards	Static accumulator - Static accumulating flammable materials can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite material and vapor may cause flash fire (or explosion). Not a PBT or vPvB substance or mixture.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Fuels, diesel	100	68334-30-5 269-822-7	01-2119484664-27-0052	649-224-00-6	
Classification:	**DSD:**	Carc. Cat. 3;R40, Xn;R20-65, Xi;R38, N;R51/53			N
	CLP:	Flam. Liq. 3;H226, Asp. Tox. 1;H304, Skin Irrit. 2;H315, Acute Tox. 4;H332, Carc. 2;H351, STOT RE 2;H373, Aquatic Chronic 2;H411			N

SECTION 4: First aid measures

General information Get medical attention if any discomfort develops.

4.1. Description of first aid measures

Inhalation

Move to fresh air. If breathing is difficult, give oxygen. Get medical attention if discomfort develops or persists.

If there is any suspicion of inhalation of H2S:
Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures.
Remove casualty to fresh air as quickly as possible.
Immediately begin artificial respiration if breathing has ceased.
Provision of oxygen may help.
Obtain medical advice for further treatment.

Skin contact

Remove contaminated clothing. Wash with soap and water. In case of rashes, wounds or other skin disorders: Seek medical attention and bring along these instructions.

Eye contact

Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention if irritation develops or persists.

Ingestion

Immediately rinse mouth and drink plenty of water or milk. Keep person under observation. Do not induce vomiting. If vomiting occurs, keep head low. Transport immediately to hospital and take these instructions. Immediately rinse mouth and drink plenty of water or milk. Keep person under observation. Do not induce vomiting. If vomiting occurs, keep head low. Seek immediate medical attention or advice.

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

Irritation of eyes and mucous membranes. Skin irritation. Defats the skin. Dermatitis. Ingestion may cause irritation and malaise. May cause damage to organs () through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure.

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

Treat symptomatically. The effects might be delayed.

SECTION 5: Firefighting measures

General fire hazards

The product is combustible, and heating may generate vapours which may form explosive vapour/air mixtures. Material will float and can be re-ignited on surface of water.

5.1. Extinguishing media

Suitable extinguishing media

Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media

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

5.2. Special hazards arising from the substance or mixture

Thermal decomposition may produce smoke, oxides of carbon and lower molecular weight organic compounds whose composition have not been characterised. Sulfur Oxides (SOx). Nitrogen Oxides (NOx).

5.3. Advice for firefighters

Special protective equipment for firefighters

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

Special fire fighting procedures

Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Keep upwind. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). In case of spills, beware of slippery floors and surfaces.

For emergency responders

Keep unnecessary personnel away. Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Extremely flammable. Review Fire and Explosion Hazard Data before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies.

6.3. Methods and material for containment and cleaning up

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Use non-sparking tools and explosion-proof equipment. Stop leak if you can do so without risk. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.

Small Spills: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste.

Large Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent product from entering drains. Do not allow material to contaminate ground water system. Should not be released into the environment. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container.

6.4. Reference to other sections

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability. (Subject to applicability) If sulfur compounds are suspected to be present in the product, check the atmosphere for H2S content. Access to work area should be restricted to people handling the product only. Aerosol producing work should be handled in closed systems, if possible. Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity . Avoid inhalation of vapours. Avoid contact with eyes, skin, and clothing. Wear personal protective equipment. Immediately change contaminated clothes. When using, do not eat, drink or smoke. Be aware of potential for surfaces to become slippery. Avoid release to the environment. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry place with adequate ventilation. Keep away from incompatible materials, open flames and high temperatures. Keep away from food, drink and animal feeding stuffs.

7.3. Specific end use(s)

Distribution of a substance. Formulation & (re) packaging of substances and mixtures. Manufacture of substance. Use as a Fuel.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Belgium. Exposure Limit Values.

Material	Type	Value	Form
Fuels, diesel (CAS 68334-30-5)	TWA	100 mg/m3	Vapor and aerosol.

Ireland. Occupational Exposure Limits

Material	Type	Value
Fuels, diesel (CAS 68334-30-5)	TWA	100 mg/m3

Italy. OELs

Material	Type	Value	Form
Fuels, diesel (CAS 68334-30-5)	TWA	100 mg/m3	Inhalable fraction and vapor.

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)

Material	Type	Value	Form
Fuels, diesel (CAS 68334-30-5)	TWA	100 mg/m3	Vapor and aerosol.

Biological limit values

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

Recommended monitoring procedures

Follow standard monitoring procedures.

Derived no-effect level (DNEL)

Material	Type	Route	Value	Form
Fuels, diesel (CAS 68334-30-5)	Workers	Dermal	2,9 mg/kg/8h	Long term exposure systemic effects
		Inhalation	4300 mg/m³/15min	Aerosol, Acute exposure systemic effects

Material	Type	Route	Value	Form
		Inhalation	68 mg/m³/8h	Aerosol, Long term exposure systemic effects

Predicted no effect concentrations (PNECs) Not available.

8.2. Exposure controls

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment.

Individual protection measures, such as personal protective equipment

General information Use personal protective equipment as required. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Keep working clothes separately. Launder contaminated clothing before reuse.

Eye/face protection Wear safety glasses. If splash potential exists, wear full face shield or chemical goggles.

Skin protection

- Hand protection Wear chemical-resistant, impervious gloves. Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Viton, Polyurethane, Nitrile rubber. Suitable gloves can be recommended by the glove supplier. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

- Other Full body suit and boots are recommended when handling large volumes or in emergency situations. Flame retardant protective clothing is recommended.

Respiratory protection In case of inadequate ventilation or risk of inhalation of vapours, use suitable respiratory equipment with gas filter (type A2). Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

Thermal hazards When material is heated, wear gloves to protect against thermal burns.

Hygiene measures When using, do not eat, drink or smoke. Wash hands after handling. Launder contaminated clothing before reuse. Private clothes and working clothes should be kept separately. Handle in accordance with good industrial hygiene and safety practices. Follow up on any medical surveillance requirements.

Environmental exposure controls Contain spills and prevent releases and observe national regulations on emissions.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance Brown liquid.

Physical state Liquid.

Form Liquid.

Colour Brown.

Odour Petroleum.

Odour threshold Not available.

pH Not applicable.

Melting point/freezing point Not applicable.

Initial boiling point and boiling range 160 - 400 °C (320 - 752 °F)

Flash point > 62,0 °C (> 143,0 °F) Pensky-Martens Closed Cup

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Vapour pressure 0,4 kPa (40°C)

Vapour density Not applicable.

Relative density 0,8 - 0,91 g/cm3

Solubility(ies) Insoluble in water.

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature >= 225 °C (>= 437 °F)

Decomposition temperature	Not available.
Viscosity	>= 1,5 mm²/s (50°C)
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

9.2. Other information

Density	0,80 - 0,91 g/cm³

SECTION 10: Stability and reactivity

10.1. Reactivity	The product is stable and non reactive under normal conditions of use, storage and transport.
10.2. Chemical stability	Stable under normal temperature conditions and recommended use.
10.3. Possibility of hazardous reactions	Hazardous polymerisation does not occur.
10.4. Conditions to avoid	Heat, flames and sparks. Ignition sources. Contact with incompatible materials. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.
10.5. Incompatible materials	Strong acids. Strong oxidizers such as nitrates, chlorates, peroxides.
10.6. Hazardous decomposition products	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

SECTION 11: Toxicological information

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

Information on likely routes of exposure

Ingestion	Ingestion may cause irritation and malaise.
Inhalation	Harmful if inhaled. Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness.
Skin contact	Repeated exposure may cause skin dryness or cracking. May be absorbed through the skin.
Eye contact	May cause eye irritation on direct contact.
Symptoms	Irritation of eyes and mucous membranes. Skin irritation. Defatting of the skin. Dermatitis. Ingestion may cause irritation and malaise. May cause damage to organs through prolonged or repeated exposure.

11.1. Information on toxicological effects

Acute toxicity	Harmful if inhaled. Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. May irritate and cause stomach pain, vomiting, diarrhoea and nausea. Hydrogen sulphide, a highly toxic gas, may be present. Signs and symptoms of overexposure to hydrogen sulphide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odour does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.

Product	Species	Test results
Fuels, diesel (CAS 68334-30-5)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg
Inhalation		
LC50	Rat	> 4,1 mg/l
Oral		
LD50	Rat	> 2000 mg/kg

Skin corrosion/irritation	Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking. Pre-existing skin conditions including dermatitis might be aggravated by exposure to this product.
Serious eye damage/eye irritation	May cause eye irritation on direct contact.
Respiratory sensitisation	Due to lack of data the classification is not possible.
Skin sensitisation	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Test data conclusive but not sufficient for classification.
Carcinogenicity	May cause cancer.
Reproductive toxicity	Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure	Test data conclusive but not sufficient for classification.

Specific target organ toxicity - repeated exposure	May cause damage to organs through prolonged or repeated exposure: Liver. Thymus. Bone marrow.
Aspiration hazard	May be fatal if swallowed and enters airways.
Mixture versus substance information	Not available.
Other information	Components of the product may be absorbed into the body through the skin.

SECTION 12: Ecological information

12.1. Toxicity	Oil spills are generally hazardous to the environment.
12.2. Persistence and degradability	The degradability of the product has not been stated.
12.3. Bioaccumulative potential	No data available on bioaccumulation.
Partition coefficient n-octanol/water (log Kow)	Not available.
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	Not available.
Mobility in general	The product is insoluble in water. It will spread on the water surface while some of the components will eventually sediment in water systems. The volatile components of the product will spread in the atmosphere.
12.5. Results of PBT and vPvB assessment	Not a PBT or vPvB substance or mixture.
12.6. Other adverse effects	Very toxic to aquatic life with long lasting effects. Oil spills are generally hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.
EU waste code	13 07 01* The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Dispose in accordance with all applicable regulations. This material and its container must be disposed of as hazardous waste. Do not discharge into drains, water courses or onto the ground.

SECTION 14: Transport information

ADR

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

RID

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

ADN

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

IATA

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

IMDG

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

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.

SECTION 15: Regulatory information

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

EU regulations

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

Not listed.

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

Not listed.

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

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

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

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(1) Candidate List as currently published by ECHA

Not listed.

Authorisations

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

Not listed.

Restrictions on use

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

Fuels, diesel (CAS 68334-30-5)

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

Not listed.

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding

Fuels, diesel (CAS 68334-30-5)

Other EU regulations

Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances

Not listed.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Fuels, diesel (CAS 68334-30-5)

Directive 94/33/EC on the protection of young people at work

Fuels, diesel (CAS 68334-30-5)

Other regulations	The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended and respective national laws implementing EC directives. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. 96/82/EC (Seveso II) Directive; Part 2 (Classified Substances) - Flammable
National regulations	Young people under 18 years old are not allowed to work with this product according to the EU Directive 94/33/EC on the protection of young people at work.
15.2. Chemical safety assessment	For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

List of abbreviations	DSD: Directive 67/548/EEC. CLP: Regulation No. 1272/2008. DNEL: Derived No-Effect Level. PNEC: Predicted No-Effect Concentration. PBT: Persistent, bioaccumulative and toxic. vPvB: Very Persistent and very Bioaccumulative.
References	CONCAWE Chemical safety report.
Information on evaluation method leading to the classification of mixture	The mixture is classified based on test data for physical hazards. The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details, refer to Sections 9, 11 and 12.
Full text of any statements or R-phrases and H-statements under Sections 2 to 15	R20 Harmful by inhalation. R38 Irritating to skin. R40 Limited evidence of a carcinogenic effect. R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R65 Harmful: may cause lung damage if swallowed. H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H332 Harmful if inhaled. H351 Suspected of causing cancer. H373 May cause damage to organs (<@1>) through prolonged or repeated exposure. H411 Toxic to aquatic life with long lasting effects.
This SDS contains revisions in the following section(s):	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16.
Training information	Follow training instructions when handling this material.

Annex to the extended Safety Data Sheet (eSDS)

1 - Exposure Scenario Worker

1. Distribution of substance

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of substances. ERC2: Formulation of preparations. ERC3: Formulation in materials. ERC4: Industrial use of processing aids in processes and products, not becoming part of articles. ERC5: Industrial use resulting in inclusion into or onto a matrix. ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates). ERC6b: Industrial use of reactive processing aids. ERC6c: Industrial use of monomers for manufacture of thermoplastics. ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC7: Industrial use of substances in closed systems. Specific Environmental Release Category: ESVOC SpERC 1.1b.v1
List of names of contributing worker scenarios and corresponding PROCs	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC15: Use as laboratory reagent.
Further explanations	
Other Process or activity	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.

2.1. Contributing scenario controlling environmental exposure for Manufacture of substances.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid With potential aerosol generation
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.

Amounts used

Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	2,8 e7
Fraction of Regional tonnage used locally:	0,002
Annual site tonnage (tons/year):	5,6 e4
Maximum daily site tonnage (kg/day):	1,9 e5

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors Air	Soil	Water	Remarks
initial release prior to RMM	300	0,001	0,00001	0,000001	

Risk management measures (RMM)

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

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

Air	Treat air emission to provide a typical removal efficiency of (%): 90
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.
Organisational 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

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

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,1
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 2,9e6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

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

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Treatment effectiveness	Not available.
Remarks	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in batch and other process (synthesis) where opportunity for exposure arises.

Process categories beyond the REACH CSA

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
Use as laboratory reagent.

Further explanations

Other process or activity

Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.

Product characteristics

Concentration of the substance in a mixture

Covers percentage substance in the product up to 100 % (unless stated differently).

Physical form of the product

Liquid With potential aerosol generation

Vapour pressure

Liquid, vapour pressure <0,5 kPa at STP.

Process temperature

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

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8		Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas

Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

General exposures (closed systems);
Handle substance within a closed system.

Bulk closed loading and unloading;
Handle substance within a closed system.

Equipment cleaning and maintenance;
Drain down system prior to equipment break-in or maintenance.

Storage;
Handle substance within a closed system.

Technical conditions and measures to control dispersion from source towards the worker

Handle substance within a closed system..

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

3. Exposure Estimation

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 mg/m³	0	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.120	**	All routes
General exposures (closed system) + With sample collection	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes
General exposures (closed system) + Batch process + With sample collection	3 mg/m³	0.040	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.160	**	All routes
General exposures open batch process	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Sample collection	3 mg/m³	0.040	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.160	**	All routes
Laboratory activities	5 mg/m³	0.070	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.020	**	Dermal Exposure
		0.190	**	All routes
Bulk transfers (closed systems) e.g bottom loading	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure

		0.550	**	All routes
Bulk transfers (open systems)	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Bulk closed loading and unloading	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Bulk open loading and unloading	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Drum and small package filling	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Equipment cleaning and maintenance	2 mg/m³	0.030	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.050	**	All routes
Bulk Storage	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes

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

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

Environment

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

2 - Exposure Scenario Worker

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

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU10: Formulation [mixing] of preparations and/or re-packaging
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC2: Formulation of preparations. Specific Environmental Release Category: ESVOC SpERC 2.2.v1
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation . PROC15: Use as laboratory reagent.
Further explanations	
Other Process or activity	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1. Contributing scenario controlling environmental exposure for Formulation of preparations.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid With potential aerosol generation
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.

Amounts used

Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	2,8 e7
Fraction of Regional tonnage used locally:	0,0011
Annual site tonnage (tons/year):	3 e4
Maximum daily site tonnage (kg/day):	1 e5

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,01	0,0001	0,00002	

Risk management measures (RMM)

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

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

Air	Treat air emission to provide a typical removal efficiency of (%): 0
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 59,9. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Organisational 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

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

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,1
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 6,8e5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

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

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Treatment effectiveness	Not available.
Remarks	External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA	Use in closed, continuous process with occasional controlled exposure. Use in closed batch process (synthesis or formulation). Use in batch and other process (synthesis) where opportunity for exposure arises. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Production of preparations or articles by tabletting, compression, extrusion, pelletisation. Use as laboratory reagent.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid With potential aerosol generation
Vapour pressure	Liquid, vapour pressure <0,5 kPa at STP.
Process temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8		Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas	Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems); Handle substance within a closed system. Bulk transfers; Handle substance within a closed system. Equipment cleaning and maintenance; Drain down system prior to equipment break-in or maintenance. Storage; Store substance within a closed system.
Technical conditions and measures to control dispersion from source towards the worker	Batch processes at elevated temperatures; Provide extract ventilation to points where emissions occur. Drum/batch transfers; Use drum pumps or carefully pour from container. Mixing operations (closed systems); Provide extract ventilation to points where emissions occur.
Organizational measures to prevent/limit releases, dispersion and exposure	General measures applicable to all activities; Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a stood standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions. General measures (skin irritants); Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluations	General exposures (open systems); Wear suitable gloves tested to EN374. Drum/batch transfers; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Bulk transfers; Wear suitable gloves tested to EN374. Mixing operations (open systems); Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Production of preparations or articles by tabletting, compression, extrusion, pelletisation; Wear suitable gloves tested to EN374. Drum and small package filling; Wear suitable gloves tested to EN374. Equipment cleaning and maintenance; Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 mg/m³	0	**	Inhalation Exposure
	0,03 mg/kg bw/day	0.010	**	Dermal Exposure
		0.010	**	All routes
General exposures (closed system) + Process sampling	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes
General exposures (closed systems)	3 mg/m³	0.040	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.160	**	All routes
General exposures open batch process	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Batch processes at elevated temperatures	0,1 mg/m³	0	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.120	**	All routes
Sample collection	3 mg/m³	0.040	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.160	**	All routes
Laboratory activities	5 mg/m³	0.070	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.190	**	All routes
Bulk transfers	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Mixing operations (open systems)	5 mg/m³	0.070	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Mixing operations (open systems)	2,5 mg/m³	0.36	**	Inhalation Exposure
	0,07 mg/kg bw/day	0.020	**	Dermal Exposure

		0.38	**	All routes
Transfer from/pouring from containers, Manual	2 mg/m³	0.030	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.500	**	All routes
Drum/batch transfers	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Transfer from/pouring from containers	5 mg/m³	0.070	**	Inhalation Exposure
	3,43 mg/kg bw/day	0.24	**	Dermal Exposure
		0.310	**	All routes
Production of preparations or articles by tabletting, compression, extrusion, pelletisation	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Equipment cleaning and maintenance	2 mg/m³	0.030	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Bulk Storage	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes

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

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

Environment

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

3 - Exposure Scenario Worker

1. Manufacture of substance

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC1: Manufacture of substances. Specific Environmental Release Category: ESVOC SpERC 1.1.v1
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC15: Use as laboratory reagent.

Further explanations

Other Process or activity	Manufacture of substance or use as process chemical or extracting 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.

2.1. Contributing scenario controlling environmental exposure for Manufacture of substances.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid With potential aerosol generation
Viscosity	
Kinematic viscosity	Not available.
Dynamic viscosity	Not available.

Amounts used

Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	2,8 e7
Fraction of Regional tonnage used locally:	0,021
Annual site tonnage (tons/year):	6 e5
Maximum daily site tonnage (kg/day):	2 e6

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,01	0,0001	0,00003	

Risk management measures (RMM)

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

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

Air	Treat air emission to provide a typical removal efficiency of (%): 90
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 90,3. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Organisational 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

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

Type	Municipal STP
Discharge rate	10000
Treatment effectiveness	94,1
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 3,3e6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

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

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not available.
Remarks	During manufacturing no waste of the substance is generated to recover.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA	Use in closed, continuous process with occasional controlled exposure. Use in closed batch process (synthesis or formulation). Use in batch and other process (synthesis) where opportunity for exposure arises. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Use as laboratory reagent.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid With potential aerosol generation
Vapour pressure	Liquid, vapour pressure <0,5 kPa at STP.
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature).

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8		Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas

Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

General exposures (closed systems);
Handle substance within a closed system.

Bulk closed loading and unloading;
Handle substance within a closed system.

Equipment cleaning and maintenance;
Drain down system prior to equipment break-in or maintenance.

Bulk product storage;
Store substance within a closed system.

Technical conditions and measures to control dispersion from source towards the worker

Not available.

Organizational measures to prevent/limit releases, dispersion and exposure

General measures applicable to all activities;
Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a stood standard of ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of exposure potential and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; provide regular health surveillance as appropriate; identify and implement corrective actions.

General measures (skin irritants);
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluations

General exposures (open systems);
Wear suitable gloves tested to EN374.

Bulk closed loading and unloading;
Wear suitable gloves tested to EN374.

Bulk open loading and unloading;
Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance;
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 mg/m³	0	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.11	**	Dermal Exposure
		0.11	**	All routes
General exposures (closed system) + Process sampling	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes
General exposures (closed systems)	3 mg/m³	0.040	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.160	**	All routes
General exposures open batch process	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Sample collection	2,1 mg/m³	0.030	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.150	**	All routes
Laboratory activities	5 mg/m³	0.070	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.190	**	All routes
Bulk transfers (closed systems) e.g bottom loading	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Bulk transfers (open systems)	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Equipment cleaning and maintenance	2 mg/m³	0.030	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.500	**	All routes
Bulk Storage	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes

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

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

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Taking into account the findings of the air monitoring evaluation on benzene included as the tier 2 analysis in the Low Boiling Point Naphtha category, the default "Air Removal Efficiency" of 90% included en the SPERC has been shown to be over-conservative and that 95% efficiency can safely be claimed in a tier 2 analysis. On this basis, the Tier 2 Analysis demonstrates that no refineries have RCRs>1 (see PETRORISK file in IUCLID section 13 - "Tier 2 Site Specific Production Worksheet").

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

4 - Exposure Scenario Worker

1. Use as a fuel

List of use descriptors

Sector(s) of Use	SU3: Industrial uses
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC7: Industrial use of substances in closed systems. Specific Environmental Release Category: ESVOC SpERC 7.12a.v1
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Further explanations	
Other Process or activity	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1. Contributing scenario controlling environmental exposure for Industrial use of substances in closed systems.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid With potential aerosol generation
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.

Amounts used

Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	4,5 e6
Fraction of Regional tonnage used locally:	0,34
Annual site tonnage (tons/year):	1,5 e6
Maximum daily site tonnage (kg/day):	5 e6

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,005	0	0,00001	

Risk management measures (RMM)

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

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

Air	Treat air emission to provide a typical removal efficiency of (%): 95
Soil	Not available.

Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 97,7. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 60,4
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Organisational 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

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

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,1
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 5,0e6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97,7

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

Suitable waste treatment	Not available.
Disposal methods	Not available.
Treatment effectiveness	Not available.
Remarks	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
Treatment effectiveness	Not available.
Remarks	Not available.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA	Use in closed, continuous process with occasional controlled exposure. Use in closed batch process (synthesis or formulation). Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Using material as fuel sources, limited exposure to unburned product to be expected.

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid With potential aerosol generation
Vapour pressure	Liquid, vapour pressure <0,5 kPa at STP.
Process temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8		Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

Storage;
Store substance within a closed system.

Equipment cleaning and maintenance;
Drain down and flush system prior to equipment break-in or maintenance.

Technical conditions and measures to control dispersion from source towards the worker

Not available.

Organizational measures to prevent/limit releases, dispersion and exposure

General measures applicable to all activities;
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

General measures (skin irritants);
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluations

Bulk transfers;
Wear suitable gloves tested to EN374.

Drum/batch transfers;
Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance;
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
Bulk transfers	5 mg/m³	0.070	**	Inhalation Exposure
	6,86	0.47	**	Dermal Exposure
		0.550	**	All routes
Drum/batch transfers	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
General exposures (closed systems)	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure

		0.49	**	All routes
Use as a fuel (closed system)	1 mg/m³	0.010	**	Inhalation Exposure
	0,03 mg/kg bw/day	0.010	**	Dermal Exposure
		0.020	**	All routes
Use as a fuel additive diluent (closed system)	1 mg/m³	0.010	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.130	**	All routes
Equipment cleaning and maintenance	1 mg/m³	0.010	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes
Vessel and container cleaning	1 mg/m³	0.010	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes
Storage	1 mg/m³	0.010	**	Inhalation Exposure
	0,14 mg/kg bw/day	0.050	**	Dermal Exposure
		0.061	**	All routes

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

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

Environment

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

5 - Exposure Scenario Worker

1. Use as an intermediate

List of use descriptors

Sector(s) of Use	SU3: Industrial uses SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Product categories [PC]:	Not available.
Name of contributing environmental scenario and corresponding ERC	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates). Specific Environmental Release Category: ESVOC SpERC 6.1a.v1
List of names of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC15: Use as laboratory reagent.
Further explanations	
Other Process or activity	Use of substance as an intermediate. Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1. Contributing scenario controlling environmental exposure for Industrial use resulting in manufacture of another substance (use of intermediates).

Product characteristics

Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently). Substance is complex UVCB. Predominantly hydrophobic.
Physical state	Liquid With potential aerosol generation
Viscosity	
Kinematic viscosity	1,6 mm²/s 40 °C
Dynamic viscosity	Not available.

Amounts used

Fraction of Regional tonnage used locally:	0,043
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tons/year):	3,5 e5
Maximum daily site tonnage (kg/day):	1,5 e4
Annual site tonnage (tons/year):	5 e4

Frequency and duration of use

Batch process	Not available.
Continuous process	Emission days (days/year): 300

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

	Emission days	Emission factors			
Type	**(days/year)**	**Air**	**Soil**	**Water**	**Remarks**
initial release prior to RMM	300	0,001	0,001	0,00003	

Risk management measures (RMM)

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

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

Air	Treat air emission to provide a typical removal efficiency of (%): 80
Soil	Not available.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 51,6. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): 0
Sediment	Not available.
Remarks	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Organisational 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

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

Type	Municipal STP
Discharge rate	2000
Treatment effectiveness	94,1
Sludge treatment technique	Not available.
Measures to limit air emissions	Not available.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 4,1e5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment

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

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment

Suitable recover operations	Not available.
Treatment effectiveness	Not available.
Remarks	This substance is consumed during use and no waste of the substance is generated to recover.
Additional good practice advice beyond the REACH CSA	Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in the PETRORISK file.

2.2. Contributing exposure scenario controlling worker exposure for Use in closed process, no likelihood of exposure.

Process categories beyond the REACH CSA	Use in closed, continuous process with occasional controlled exposure. Use in closed batch process (synthesis or formulation). Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. Use as laboratory reagent.
Product characteristics	
Concentration of the substance in a mixture	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product	Liquid With potential aerosol generation
Vapour pressure	Liquid, vapour pressure <0,5 kPa at STP.
Process temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature).

Amounts used

Not available.

Frequency and duration of use

	Duration	Frequency of use	Remarks
Covers daily exposures up to 8 hours (unless stated differently).	8		Assumes a good basic standard of occupational hygiene is implemented.

Human factors not influenced by risk management

Exposed skin areas Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Other given operational conditions affecting workers exposure

Area of use	Room size	Temperature	Ventilation rate	Remarks

Other relevant operational conditions

Not available.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

General exposures (closed systems);
Handle substance within a closed system.

Bulk closed loading and unloading;
Handle substance within a closed system.

Equipment cleaning and maintenance;
Drain down and flush system prior to equipment break-in or maintenance.

Bulk product storage;
Store substance within a closed system.

Technical conditions and measures to control dispersion from source towards the worker

Handle substance within a closed system..

Organizational measures to prevent/limit releases, dispersion and exposure

General measures applicable to all activities;
Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

Conditions and measures related to personal protection, hygiene and health evaluations

General measures (skin irritants);
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

General exposures (closed systems);
Wear suitable gloves tested to EN374.

Bulk closed loading and unloading;
Wear suitable gloves tested to EN374.

Bulk open loading and unloading;
Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance;
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

3. Exposure Estimation

Environment

See PETRORISK file in IUCLID Section 13 - "LocalCSR" worksheet.

Health

	Exposure level	RCR	Method	Remarks
General exposures (closed systems)	0,01 mg/m³	0	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.11	**	Dermal Exposure
		0.11	**	All routes
General exposures (closed system) + Process sampling	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes
General exposures (closed systems)	3 mg/m³	0.040	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.160	**	All routes
General exposures open batch process	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Sample collection	2,1 mg/m³	0.030	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.150	**	All routes
Laboratory activities	5 mg/m³	0.070	**	Inhalation Exposure
	0,34 mg/kg bw/day	0.120	**	Dermal Exposure
		0.190	**	All routes
Bulk transfers (closed systems) e.g bottom loading	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Bulk transfers (open systems)	5 mg/m³	0.070	**	Inhalation Exposure
	6,86 mg/kg bw/day	0.47	**	Dermal Exposure
		0.550	**	All routes
Equipment cleaning and maintenance	2 mg/m³	0.030	**	Inhalation Exposure
	13,71 mg/kg bw/day	0.47	**	Dermal Exposure
		0.500	**	All routes
Bulk Storage	1 mg/m³	0.010	**	Inhalation Exposure
	1,37 mg/kg bw/day	0.47	**	Dermal Exposure
		0.49	**	All routes

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

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

Environment

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.