

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

### 1.1. Product identifier

<b>Trade name or designation of the mixture</b>	Kerosene - All Grades (Refer to Synonyms for Product Name)
<b>Registration number</b>	-
<b>Synonyms</b>	Kerosene, Unmarked * Kerosene, Marked
<b>SDS number</b>	2009
<b>Issue date</b>	10-January-2020
<b>Version number</b>	03
<b>Revision date</b>	30-June-2020
<b>Supersedes date</b>	07-February-2020

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

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

### 1.3. Details of the supplier of the safety data sheet

#### Supplier

<b>Company name</b>	Mitchell & Webber Ltd
<b>Address</b>	Fuel Depot Scorrier Redruth TR16 5UT United Kingdom
<b>Telephone</b>	01209 821676
<b>e-mail</b>	mitweb@mitweb.co.uk
<b>Contact person</b>	Christopher Smith
<b>1.4. Emergency telephone number</b>	0333 3339961

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

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

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

##### Physical hazards

Flammable liquids	Category 3	H226 - Flammable liquid and vapour.
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##### Health hazards

Skin corrosion/irritation	Category 2	H315 - Causes skin irritation.
Specific target organ toxicity - single exposure	Category 3 narcotic effects	H336 - May cause drowsiness or dizziness.
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.
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<b>Hazard summary</b>	May be ignited by heat, sparks or flames. May be fatal if swallowed and enters airways. May cause drowsiness and dizziness. Causes skin irritation. Dangerous for the environment if discharged into watercourses.
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### 2.2. Label elements

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

<b>Contains:</b>	Kerosine (petroleum), hydrodesulphurized, Kerosine (petroleum), sweetened
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## Hazard pictograms



## Signal word

Danger

## Hazard statements

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H411	Toxic to aquatic life with long lasting effects.

## Precautionary statements

### Prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

### Response

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

### Storage

Not assigned.

### Disposal

Not assigned.

## Supplemental label information

None.

## 2.3. Other hazards

Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

## SECTION 3: Composition/information on ingredients

### 3.2. Mixtures

#### General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Kerosine (petroleum), hydrodesulphurized	0 - 100	64742-81-0 265-184-9	01-2119462828-25	649-423-00-8	<b>Classification:</b> Flam. Liq. 3;H226, Asp. Tox. 1;H304, Skin Irrit. 2;H315, STOT SE 3;H336, Aquatic Chronic 2;H411
Kerosine (petroleum), sweetened	0 - 100	91770-15-9 294-799-5	01-2119502385-46-0021	649-427-00-X	<b>Classification:</b> Flam. Liq. 3;H226, Asp. Tox. 1;H304, Skin Irrit. 2;H315, STOT SE 3;H336, Aquatic Chronic 2;H411

#### Composition comments

All concentrations are in percent by weight unless ingredient is a gas. The full text for all H-statements is displayed in section 16.

## SECTION 4: First aid measures

#### General information

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

#### 4.1. Description of first aid measures

##### Inhalation

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

##### Skin contact

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

##### Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

##### Ingestion

Call a physician or poison control centre immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

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

Aspiration may cause pulmonary oedema and pneumonitis. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Diarrhoea. Direct contact with eyes may cause temporary irritation. Skin irritation. May cause redness and pain.

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

Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

## SECTION 5: Firefighting measures

<b>General fire hazards</b>	Flammable liquid and vapour.
<b>5.1. Extinguishing media</b>	
<b>Suitable extinguishing media</b>	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	Do not use water jet as an extinguisher, as this will spread the fire.
<b>5.2. Special hazards arising from the substance or mixture</b>	Vapours may form explosive mixtures with air. Vapours may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.
<b>5.3. Advice for firefighters</b>	
<b>Special protective equipment for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Special fire fighting procedures</b>	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.

## SECTION 6: Accidental release measures

<b>6.1. Personal precautions, protective equipment and emergency procedures</b>	
<b>For non-emergency personnel</b>	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist/vapours. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.
<b>For emergency responders</b>	Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up.
<b>6.2. Environmental precautions</b>	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
<b>6.3. Methods and material for containment and cleaning up</b>	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil etc) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. The product is immiscible with water and will sediment in water systems. Prevent entry into waterways, sewer, basements or confined areas.  Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.  Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Clean surface thoroughly to remove residual contamination.  Never return spills to original containers for re-use.
<b>6.4. Reference to other sections</b>	For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

## SECTION 7: Handling and storage

<b>7.1. Precautions for safe handling</b>	Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability. (Subject to applicability) If sulphur compounds are suspected to be present in the product, check the atmosphere for H <sub>2</sub> S content. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid breathing mist/vapours. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.
<b>7.2. Conditions for safe storage, including any incompatibilities</b>	Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see section 10 of the SDS).
<b>7.3. Specific end use(s)</b>	For detailed information, see section 1.

## SECTION 8: Exposure controls/personal protection

<b>8.1. Control parameters</b>	
<b>Occupational exposure limits</b>	No exposure limits noted for ingredient(s).
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).

**Recommended monitoring procedures** Follow standard monitoring procedures.

#### Derived no effect levels (DNELs)

##### General Population

Components	Value	Assessment factor	Notes
Kerosine (petroleum), hydrodesulphurized (CAS 64742-81-0)			
Long-term, Systemic, Oral	18.75 mg/kg bw/day	40	Repeated dose toxicity
Kerosine (petroleum), sweetened (CAS 91770-15-9)			
Long-term, Systemic, Oral	18.75 mg/kg bw/day	40	Repeated dose toxicity

**Predicted no effect concentrations (PNECs)** Not available.

#### 8.2. Exposure controls

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

#### Individual protection measures, such as personal protective equipment

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

**Eye/face protection** Chemical respirator with organic vapour cartridge and full facepiece. Eye protection should meet standard EN 166.

##### **Skin protection**

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

**- Other** Wear appropriate chemical resistant clothing.

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

**Thermal hazards** Wear appropriate thermal protective clothing, when necessary.

**Hygiene measures** When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**Environmental exposure controls** Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Appearance

**Physical state** Liquid.

**Form** Liquid.

**Colour** Not available.

**Odour** Not available.

**Odour threshold** Not available.

**pH** Not available.

**Melting point/freezing point** -49 °C (-56.2 °F)

**Initial boiling point and boiling range** 146 - 299 °C (294.8 - 570.2 °F)

**Flash point** 29.0 - 70.0 °C (84.2 - 158.0 °F)

**Evaporation rate** Not available.

**Flammability (solid, gas)** Not applicable.

#### Upper/lower flammability or explosive limits

**Flammability limit - lower (%)** Not available.

**Flammability limit - upper (%)** Not available.

**Vapour pressure** 0.06 kPa (20 °C (68 °F))

<b>Vapour density</b>	4.5
<b>Relative density</b>	Not available.
<b>Solubility(ies)</b>	Insoluble in water.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	220 - 250 °C (428 - 482 °F)
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	1 - 2.4 cSt (40 °C (104 °F))
<b>Explosive properties</b>	Not explosive.
<b>Oxidising properties</b>	Not oxidising.
<b>9.2. Other information</b>	No relevant additional information available.

## SECTION 10: Stability and reactivity

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

## SECTION 11: Toxicological information

<b>General information</b>	Occupational exposure to the substance or mixture may cause adverse effects.
<b>Information on likely routes of exposure</b>	
<b>Inhalation</b>	May cause drowsiness and dizziness. Headache. Nausea, vomiting. Prolonged inhalation may be harmful.
<b>Skin contact</b>	Causes skin irritation.
<b>Eye contact</b>	Direct contact with eyes may cause temporary irritation.
<b>Ingestion</b>	Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
<b>Symptoms</b>	Aspiration may cause pulmonary oedema and pneumonitis. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Diarrhoea. Skin irritation. May cause redness and pain.

### 11.1. Information on toxicological effects

**Acute toxicity** May be fatal if swallowed and enters airways.

Components	Species	Test Results
Kerosine (petroleum), hydrodesulphurized (CAS 64742-81-0)		
<b>Acute</b>		
<b>Dermal</b>		
LD50	Rabbit	> 2000 mg/kg
<b>Inhalation</b>		
<i>Vapour</i>		
LC50	Rat	> 5.28 mg/l, 4 Hours
<b>Oral</b>		
LD50	Rat	> 5000 mg/kg
Kerosine (petroleum), sweetened (CAS 91770-15-9)		
<b>Acute</b>		
<b>Dermal</b>		
LD50	Rabbit	> 2000 mg/kg
<b>Inhalation</b>		
<i>Vapour</i>		
LC50	Rat	> 5.28 mg/l, 4 Hours
<b>Oral</b>		
LD50	Rat	> 5000 mg/kg
<b>Skin corrosion/irritation</b>	Causes skin irritation.	

<b>Serious eye damage/eye irritation</b>	Direct contact with eyes may cause temporary irritation.
<b>Respiratory sensitisation</b>	Based on available data, the classification criteria are not met.
<b>Skin sensitisation</b>	Based on available data, the classification criteria are not met.
<b>Germ cell mutagenicity</b>	Based on available data, the classification criteria are not met.
<b>Carcinogenicity</b>	Based on available data, the classification criteria are not met.
<b>Reproductive toxicity</b>	Based on available data, the classification criteria are not met.
<b>Specific target organ toxicity - single exposure</b>	May cause drowsiness and dizziness.
<b>Specific target organ toxicity - repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	May be fatal if swallowed and enters airways.
<b>Mixture versus substance information</b>	No information available.
<b>Other information</b>	May be absorbed through the skin.

## SECTION 12: Ecological information

**12.1. Toxicity** Toxic to aquatic life with long lasting effects. Based on available data, the classification criteria are not met for hazardous to the aquatic environment, acute hazard.

Components	Species		Test Results
Kerosene (petroleum), hydrodesulphurized (CAS 64742-81-0)			
<b>Aquatic</b>			
<i>Acute</i>			
Crustacea	EL50	Daphnia	1.4 mg/l, 48 hours
Fish	LL50	Freshwater fish	2 - 5 mg/l, 96 hours
<i>Chronic</i>			
Fish	NOEL	Freshwater fish	0.098 mg/l
Kerosene (petroleum), sweetened (CAS 91770-15-9)			
<b>Aquatic</b>			
<i>Acute</i>			
Crustacea	EL50	Daphnia	1.4 mg/l, 48 hours
Fish	LL50	Freshwater fish	2 - 5 mg/l, 96 hours
<i>Chronic</i>			
Fish	NOEL	Freshwater fish	0.098 mg/l

**12.2. Persistence and degradability** Expected to be inherently biodegradable.

**12.3. Bioaccumulative potential** The product is not bioaccumulating.

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

**Bioconcentration factor (BCF)** Not available.

**12.4. Mobility in soil** No data available.

**12.5. Results of PBT and vPvB assessment** This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

**12.6. Other adverse 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. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.

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

**EU waste code** 13 07 03\*  
The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

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

**Special precautions** Dispose in accordance with all applicable regulations.

## SECTION 14: Transport information

### ADR

14.1. UN number UN1223  
14.2. UN proper shipping name KEROSENE  
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 UN1223  
14.2. UN proper shipping name KEROSENE  
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 UN1223  
14.2. UN proper shipping name Kerosene  
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 UN1223  
14.2. UN proper shipping name Kerosene  
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 UN1223  
14.2. UN proper shipping name KEROSENE  
14.3. Transport hazard class(es)  
Class 3  
Subsidiary risk -  
Label(s) 3

<b>14.4. Packing group</b>	III
<b>14.5. Environmental hazards</b>	
<b>Marine pollutant</b>	Yes
<b>EmS</b>	F-E, S-E
<b>14.6. Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	Not applicable. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.
<b>General information</b>	Shipping descriptions in this section are offered as examples only. Classification for transport must accurately reflect the material hazards as designated under a variety of regulations and is solely the responsibility of the person offering the material for transport into commerce.

## SECTION 15: Regulatory information

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

#### EU regulations

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

Not listed.

**Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended**

Not listed.

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

Not listed.

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

Not listed.

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

Not listed.

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

Not listed.

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

Not listed.

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

Not listed.

#### Authorisations

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

Not listed.

#### Restrictions on use

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

Not listed.

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

Not listed.

#### Other EU regulations

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

Not listed.

#### Other regulations

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

Directive 2012/18/EU on major accident hazards involving dangerous substances: Part 2 (Named dangerous substances) - 34. Petroleum products and alternative fuels.

#### National regulations

Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.

### 15.2. Chemical safety assessment

Chemical Safety Assessment has been carried out.

## SECTION 16: Other information

#### List of abbreviations

PBT: Persistent, bioaccumulative and toxic.  
vPvB: Very Persistent and very Bioaccumulative.  
DNEL: Derived No-Effect Level.  
PNEC: Predicted No-Effect Concentration.

**References**

Chemical safety report.  
CONCAWE  
ECHA: European Chemical Agency.

**Information on evaluation method leading to the classification of mixture**

Not applicable.

**Full text of any H-statements not written out in full under Sections 2 to 15**

H226 Flammable liquid and vapour.  
H304 May be fatal if swallowed and enters airways.  
H315 Causes skin irritation.  
H336 May cause drowsiness or dizziness.  
H411 Toxic to aquatic life with long lasting effects.

**Training information**

Follow training instructions when handling this material.

**Disclaimer**

The information in this Safety Data Sheet (SDS) was obtained from sources believed to be reliable and accurate, and is not represented as being absolutely complete. The end user of this product has the responsibility for evaluating the adequacy of the data for the intended application and conditions of use; for determining the safety, toxicity, regulatory requirements, and suitability of the product under these conditions; and for obtaining additional or clarifying data where uncertainty exists. The data serves as general guidance only, and is to be used in combination with professional judgement of persons experienced in a specific application, use or process; and additional data may be required.

## Annex to the extended Safety Data Sheet (eSDS)

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# 1 - Exposure Scenario Worker

## 1. Manufacture of substance

### List of use descriptors

**Sector(s) of Use** SU3: Industrial uses

**Name of contributing environmental scenario and corresponding ERC** ERC1: Manufacture of the substance

**List of names of contributing worker scenarios and corresponding PROCs**

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions  
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
PROC4: Chemical production where opportunity for exposure arises  
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities  
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities  
PROC15: Use as laboratory reagent

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

#### Product characteristics

**Physical state** Liquid.  
Substance is complex UVCB. Predominantly hydrophobic

#### Amounts used

**Fraction of EU tonnage used in region** 0.1  
**Regional use tonnage** 1900000 tonnes/year  
**Fraction of regional tonnage used locally** 0.95  
**Annual site tonnage** 1800000 tonnes/year  
**Maximum daily site tonnage** 6100000 kg/day

#### Frequency and duration of use

**Continuous process** 300 days/year

#### Environment factors not influenced by risk management

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

#### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors			Remarks
		Air	Soil	Water	
initial release prior to RMM	300	0.05	0.0001	0.0003	

#### Risk management measures (RMM)

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

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

**Air** Treat air emission to provide a typical removal efficiency of (%): 90  
**Soil** Not applicable.  
**Water** Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of  $\geq$  (%): 99.7. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of  $\geq$  (%): 93.5.  
**Sediment** Not applicable.

**Organisational measures to prevent/limit release from site** Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required.

#### Conditions and measures related to municipal sewage treatment plant

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

**Type** Municipal Sewage Treatment Plant

<b>Discharge rate</b>	1000 m <sup>3</sup> /day
<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 6.1e6 kg/d
<b>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</b>	99.7 %

#### Conditions and measures related to external treatment of waste for disposal

##### Fraction of used amount transferred to external waste treatment

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

#### Conditions and measures related to external recovery of waste

##### Fraction of used amount transferred to external waste treatment

<b>Suitable recover operations</b>	During manufacturing no waste of the substance is generated.
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### 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

#### Product characteristics

<b>Physical form of the product</b>	Liquid.
<b>vapour pressure</b>	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

#### Amounts used

Covers percentage substance in the product up to 100 %.

#### Frequency and duration of use

Covers daily exposures up to 8 hours

#### Human factors not influenced by risk management

#### Other given operational conditions affecting workers exposure

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

#### Other relevant operational conditions

Assumes a good basic standard of occupational hygiene is implemented

#### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	General exposures (closed systems): No other specific measures identified. Bulk product storage: No other specific measures identified.
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	General exposures (open systems): No other specific measures identified. Process sampling: No other specific measures identified. Laboratory activities: No other specific measures identified.
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	Equipment cleaning and maintenance: No other specific measures identified.
<b>Conditions and measures related to personal protection, hygiene and health evaluations</b>	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.

## 3. Exposure Estimation

### Environment

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

### Health

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

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

##### Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.

##### Health

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

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

#### 2.1.1. Contributing scenario controlling environmental exposure for Formulation into mixture

##### Product characteristics

<b>Physical state</b>	Liquid. Substance is complex UVCB. Predominantly hydrophobic
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##### Amounts used

<b>Fraction of EU tonnage used in region</b>	0.1
<b>Regional use tonnage</b>	2100000 tonnes/year
<b>Fraction of regional tonnage used locally</b>	0.014
<b>Annual site tonnage</b>	30000 tonnes/year
<b>Maximum daily site tonnage</b>	100000 kg/day

##### Frequency and duration of use

<b>Continuous process</b>	300 days/year
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##### Environment factors not influenced by risk management

<b>Local freshwater dilution factor:</b>	10
<b>Local marine water dilution factor:</b>	100

##### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors			Remarks
		Air	Soil	Water	
initial release prior to RMM	300	0.025	0.0001	0.0002	

##### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	Common practices vary across sites thus conservative process release estimates used.
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##### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

<b>Air</b>	Treat air emission to provide a typical removal efficiency of (%): 0
<b>Soil</b>	Not applicable.
<b>Water</b>	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%): 94.2. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%): 0.
<b>Sediment</b>	Not applicable.

<b>Organisational measures to prevent/limit release from site</b>	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.
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## Conditions and measures related to municipal sewage treatment plant

### Size of municipal sewage system/treatment plant (m<sup>3</sup>/d)

Type	Onsite Sewage Treatment Plant
Discharge rate	20000 m <sup>3</sup> /day
Treatment effectiveness	95.1 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 1.2e5 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95.1 %

## Conditions and measures related to external treatment of waste for disposal

### Fraction of used amount transferred to external waste treatment

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

## Conditions and measures related to external recovery of waste

### Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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## 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

### Product characteristics

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

### Amounts used

Covers percentage substance in the product up to 100 %.

### Frequency and duration of use

Covers daily exposures up to 8 hours

### Human factors not influenced by risk management

### Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

### Other relevant operational conditions

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

### Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): No other specific measures identified. Bulk product storage: No other specific measures identified.
Technical conditions and measures to control dispersion from source towards the worker	General exposures (open systems): No other specific measures identified. Process sampling: No other specific measures identified. Laboratory activities: No other specific measures identified. Bulk transfers: No other specific measures identified. Mixing operations (open systems): No other specific measures identified. Manual Transfer from/pouring from containers: No other specific measures identified. Tabletting, compression, extrusion or pelletisation: No other specific measures identified. Drum/batch transfers: No other specific measures identified. Drum and small package filling: No other specific measures identified.

**Organizational measures to prevent/limit releases, dispersion and exposure**

Equipment cleaning and maintenance: No other specific measures identified.

**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.

### 3. Exposure Estimation

#### Environment

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

#### Health

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

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

#### Environment

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

#### Health

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

### 3 - Exposure Scenario Worker

#### 1. Use as an intermediate

##### List of use descriptors

**Sector(s) of Use** SU8: Manufacture of bulk, large scale chemicals (including petroleum products)  
SU9: Manufacture of fine chemicals

##### Name of contributing environmental scenario and corresponding ERC

ERC6a: Use of intermediate

##### List of names of contributing worker scenarios and corresponding PROCs

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions  
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities  
PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities  
PROC15: Use as laboratory reagent

#### 2.1.1. Contributing scenario controlling environmental exposure for Use of intermediate

##### Product characteristics

**Physical state** Liquid.  
Substance is complex UVCB. Predominantly hydrophobic

##### Amounts used

**Fraction of EU tonnage used in region** 0.1  
**Regional use tonnage** 270000 tonnes/year  
**Fraction of regional tonnage used locally** 0.055  
**Annual site tonnage** 15000 tonnes/year  
**Maximum daily site tonnage** 50000 kg/day

##### Frequency and duration of use

**Continuous process** 300 days/year

##### Environment factors not influenced by risk management

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

##### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors			Remarks
		Air	Soil	Water	
initial release prior to RMM	300	0.01	0.001	0.0003	

##### Risk management measures (RMM)

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

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

**Air** Treat air emission to provide a typical removal efficiency of (%): 80  
**Soil** Not applicable.  
**Water** Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of  $\geq$  (%): 92.3. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of  $\geq$  (%): 0.  
**Sediment** Not applicable.

**Organisational measures to prevent/limit release from site** Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

##### Conditions and measures related to municipal sewage treatment plant

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

**Type** Municipal Sewage Treatment Plant

<b>Discharge rate</b>	2000 m <sup>3</sup> /day
<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 7.9e4 kg/d
<b>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</b>	95.1 %

#### Conditions and measures related to external treatment of waste for disposal

##### Fraction of used amount transferred to external waste treatment

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

#### Conditions and measures related to external recovery of waste

##### Fraction of used amount transferred to external waste treatment

<b>Suitable recover operations</b>	This substance is consumed during use and no waste of the substance is generated.
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### 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

#### Product characteristics

<b>Physical form of the product</b>	Liquid
<b>vapour pressure</b>	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

#### Amounts used

Covers percentage substance in the product up to 100 %.

#### Frequency and duration of use

Covers daily exposures up to 8 hours

#### Human factors not influenced by risk management

#### Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

#### Other relevant operational conditions

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

#### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	General exposures (closed systems): No other specific measures identified. Bulk product storage: No other specific measures identified.
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	General exposures (open systems): No other specific measures identified. Bulk transfers: No other specific measures identified. Laboratory activities: No other specific measures identified. Process sampling: No other specific measures identified.
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	Equipment cleaning and maintenance: No other specific measures identified.
<b>Conditions and measures related to personal protection, hygiene and health evaluations</b>	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.

## 3. Exposure Estimation

### Environment

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

## Health

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

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

#### Environment

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

#### Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

## 4 - Exposure Scenario Worker

### 1. Distribution of substance

#### List of use descriptors

<b>Sector(s) of Use</b>	Distribution of substance
<b>Name of contributing environmental scenario and corresponding ERC</b>	ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5: Use at industrial site leading to inclusion into/onto article ERC6a: Use of intermediate ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7: Use of functional fluid at industrial site

#### List of names of contributing worker scenarios and corresponding PROCs

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions  
 PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
 PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
 PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities  
 PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities  
 PROC15: Use as laboratory reagent

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

#### Product characteristics

**Physical state** Liquid.  
 Substance is complex UVCB. Predominantly hydrophobic

#### Amounts used

**Fraction of EU tonnage used in region** 0.1  
**Regional use tonnage** 2400000 tonnes/year  
**Fraction of regional tonnage used locally** 0.002  
**Annual site tonnage** 4800 tonnes/year  
**Maximum daily site tonnage** 48000 kg/day

#### Frequency and duration of use

**Continuous process** 300 days/year

#### Environment factors not influenced by risk management

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

#### Other given operational conditions affecting environmental exposure

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

#### Risk management measures (RMM)

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

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

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

**Organisational measures to prevent/limit release from site** Risk from environmental exposure is driven by freshwater. No wastewater treatment required.

#### Conditions and measures related to municipal sewage treatment plant

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

<b>Type</b>	Municipal Sewage Treatment Plant
<b>Discharge rate</b>	2000 m <sup>3</sup> /day
<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 2.4e6 kg/d
<b>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</b>	95.1 %

#### Conditions and measures related to external treatment of waste for disposal

##### Fraction of used amount transferred to external waste treatment

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

#### Conditions and measures related to external recovery of waste

##### Fraction of used amount transferred to external waste treatment

<b>Suitable recover operations</b>	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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## 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

#### Product characteristics

<b>Physical form of the product</b>	Liquid.
<b>vapour pressure</b>	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

#### Amounts used

Covers percentage substance in the product up to 100 %.

#### Frequency and duration of use

Covers daily exposures up to 8 hours

#### Human factors not influenced by risk management

#### Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

#### Other relevant operational conditions

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

#### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	General exposures (closed systems): No other specific measures identified. Bulk product storage: No other specific measures identified.
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	Process sampling: No other specific measures identified. Laboratory activities: No other specific measures identified. Bulk transfers: No other specific measures identified. Drum and small package filling: No other specific measures identified. General exposures (open systems): No other specific measures identified.
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	Equipment cleaning and maintenance: No other specific measures identified.

**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.

### **3. Exposure Estimation**

#### **Environment**

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

#### **Health**

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

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

#### **Environment**

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

#### **Health**

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

## 5 - Exposure Scenario Worker

### 1. Use in cleaning agents

#### List of use descriptors

**Sector(s) of Use** SU3: Industrial uses

**Name of contributing environmental scenario and corresponding ERC** ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

**List of names of contributing worker scenarios and corresponding PROCs**

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions  
 PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
 PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
 PROC4: Chemical production where opportunity for exposure arises  
 PROC7: Industrial spraying  
 PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities  
 PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities  
 PROC10: Roller application or brushing  
 PROC13: Treatment of articles by dipping and pouring

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

##### Product characteristics

**Physical state** Liquid.  
 Substance is complex UVCB. Predominantly hydrophobic

##### Amounts used

**Fraction of EU tonnage used in region** 0.1  
**Regional use tonnage** 3.8 tonnes/year  
**Fraction of regional tonnage used locally** 1  
**Annual site tonnage** 3.8 tonnes/year  
**Maximum daily site tonnage** 190 kg/day

##### Frequency and duration of use

**Continuous process** Emission days (days/year): 20

##### Environment factors not influenced by risk management

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

##### Other given operational conditions affecting environmental exposure

Type	Emission days		Emission factors			Remarks
	(days/year)	Air	Soil	Water		
initial release prior to RMM	20	1	0	0.000003		

##### 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 (%): 70  
**Soil** Not applicable.  
**Water** Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of  $\geq$  (%): 0. If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of  $\geq$  (%): 0  
**Sediment** Not applicable.

**Organisational measures to prevent/limit release from site** Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.

##### Conditions and measures related to municipal sewage treatment plant

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

<b>Type</b>	Municipal Sewage Treatment Plant
<b>Discharge rate</b>	2000 m <sup>3</sup> /day
<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 2.8e4 kg/d
<b>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</b>	95.1 %

**Conditions and measures related to external treatment of waste for disposal****Fraction of used amount transferred to external waste treatment**

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

**Conditions and measures related to external recovery of waste****Fraction of used amount transferred to external waste treatment**

<b>Suitable recover operations</b>	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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**2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions****Product characteristics**

<b>Physical form of the product</b>	Liquid.
<b>vapour pressure</b>	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

**Amounts used**

Covers percentage substance in the product up to 100 %.

**Frequency and duration of use**

Covers daily exposures up to 8 hours

**Human factors not influenced by risk management****Other given operational conditions affecting workers exposure**

Assumes a good basic standard of occupational hygiene is implemented.

**Other relevant operational conditions**

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

**Risk management measures (RMM)**

<b>Technical conditions and measures at process level (source) to prevent release</b>	General exposures (closed systems): No other specific measures identified. Storage, Product sampling: No other specific measures identified.
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**Technical conditions and measures to control dispersion from source towards the worker**

Bulk transfers: No other specific measures identified.

Automated process with (semi) closed systems, Use in contained systems: No other specific measures identified.

Automated process with (semi) closed systems, Use in contained systems, Drum/batch transfers: No other specific measures identified.

Application of cleaning products in closed systems: No other specific measures identified.

Filling / preparation of equipment from drums or containers, Dedicated facility: No other specific measures identified.

Use in contained batch processes, Semi automated process. (e.g.: semi automatic application of floor care and maintenance products) : No other specific measures identified.

Dipping, immersion and pouring: No other specific measures identified.

Cleaning with low-pressure washers: No other specific measures identified.

Cleaning with high pressure washers: No other specific measures identified.

Manual, cleaning, Surfaces, No spraying: No other specific measures identified.

**Organizational measures to prevent/limit releases, dispersion and exposure**

Equipment cleaning and maintenance: No other specific measures identified.

**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.

### 3. Exposure Estimation

#### Environment

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

#### Health

Not available.

### 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.

#### Health

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.

## 6 - Exposure Scenario Worker

### 1. Uses in Coatings, Industrial.

#### List of use descriptors

<b>Sector(s) of Use</b>	SU3: Industrial uses
<b>Name of contributing environmental scenario and corresponding ERC</b>	ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
<b>List of names of contributing worker scenarios and corresponding PROCs</b>	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC7: Industrial spraying PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent

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

##### Product characteristics

<b>Physical state</b>	Liquid. Substance is complex UVCB. Predominantly hydrophobic
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##### Amounts used

<b>Fraction of EU tonnage used in region</b>	0.1
<b>Regional use tonnage</b>	3.2 tonnes/year
<b>Fraction of regional tonnage used locally</b>	1
<b>Annual site tonnage</b>	3.2 tonnes/year
<b>Maximum daily site tonnage</b>	160 kg/day

##### Frequency and duration of use

<b>Continuous process</b>	Emission days (days/year): 20
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##### Environment factors not influenced by risk management

<b>Local freshwater dilution factor:</b>	10
<b>Local marine water dilution factor:</b>	100

##### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)		Emission factors			Remarks
		Air	Soil	Water		
initial release prior to RMM	20	0.98	0	0.0007		

##### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	Common practices vary across sites thus conservative process release estimates used.
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##### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

<b>Air</b>	Treat air emission to provide a typical removal efficiency of (%): 90
<b>Soil</b>	Not applicable.
<b>Water</b>	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%): 0. If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%): 0
<b>Sediment</b>	Not applicable.

<b>Organisational measures to prevent/limit release from site</b>	Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.
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## Conditions and measures related to municipal sewage treatment plant

### Size of municipal sewage system/treatment plant (m<sup>3</sup>/d)

Type	Municipal Sewage Treatment Plant
Discharge rate	2000 m <sup>3</sup> /day
Treatment effectiveness	95.1 %
Sludge treatment technique	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Remarks	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 1.5e4 kg/d
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95.1 %

## Conditions and measures related to external treatment of waste for disposal

### Fraction of used amount transferred to external waste treatment

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

## Conditions and measures related to external recovery of waste

### Fraction of used amount transferred to external waste treatment

Suitable recover operations	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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## 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

### Product characteristics

Physical form of the product	Liquid.
vapour pressure	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

### Amounts used

Covers percentage substance in the product up to 100 %.

### Frequency and duration of use

Covers daily exposures up to 8 hours

### Human factors not influenced by risk management

#### Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

#### Other relevant operational conditions

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

### Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release	General exposures (closed systems): No other specific measures identified. Storage, Product sampling: No other specific measures identified.
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**Technical conditions and measures to control dispersion from source towards the worker**

Film formation - force drying, stoving and other technologies: No other specific measures identified.

Preparation of material for application, Mixing operations (open systems): No other specific measures identified.

Spraying (automatic/robotic): No other specific measures identified.

Manual spraying: No other specific measures identified.

Material transfers, Dedicated facility: No other specific measures identified.

Material transfers, Non-dedicated facility: No other specific measures identified.

Roller, spreader, flow application: No other specific measures identified.

Dipping, immersion and pouring: No other specific measures identified.

Laboratory activities: No other specific measures identified.

Equipment cleaning and maintenance: No other specific measures identified.

**Organizational measures to prevent/limit releases, dispersion and exposure**

**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.

### 3. Exposure Estimation

#### Environment

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

#### Health

Not available.

### 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.

#### Health

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

## 7 - Exposure Scenario Worker

### 1. Use as a fuel, Industrial

#### List of use descriptors

**Sector(s) of Use** Industrial uses

**Name of contributing environmental scenario and corresponding ERC** ERC7: Use of functional fluid at industrial site

**List of names of contributing worker scenarios and corresponding PROCs**

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions  
 PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
 PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
 PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities  
 PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities  
 PROC16: Use of fuels

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

##### Product characteristics

**Physical state** Liquid.  
 Substance is complex UVCB. Predominantly hydrophobic

##### Amounts used

**Fraction of EU tonnage used in region** 0.1  
**Regional use tonnage** 370000 tonnes/year  
**Fraction of regional tonnage used locally** 1  
**Annual site tonnage** 370000 tonnes/year  
**Maximum daily site tonnage** 1200000 kg/day

##### Frequency and duration of use

**Continuous process** 300 days/year

##### Environment factors not influenced by risk management

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

##### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors			Remarks
		Air	Soil	Water	
initial release prior to RMM	300	0.05	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 applicable.  
**Water** Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of  $\geq$  (%): 90.7. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of  $\geq$  (%): 0.  
**Sediment** Not applicable.

**Organisational measures to prevent/limit release from site** Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

##### Conditions and measures related to municipal sewage treatment plant

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

**Type** Municipal Sewage Treatment Plant  
**Discharge rate** 2000 m<sup>3</sup>/day

<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 2.4e6 kg/d
<b>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</b>	95.1 %

#### Conditions and measures related to external treatment of waste for disposal

##### Fraction of used amount transferred to external waste treatment

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

#### Conditions and measures related to external recovery of waste

##### Fraction of used amount transferred to external waste treatment

<b>Suitable recover operations</b>	This substance is consumed during use and no waste of the substance is generated.
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### 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

#### Product characteristics

<b>Physical form of the product</b>	Liquid.
<b>vapour pressure</b>	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

#### Amounts used

Covers percentage substance in the product up to 100 %.

#### Frequency and duration of use

Covers daily exposures up to 8 hours

#### Human factors not influenced by risk management

##### Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

##### Other relevant operational conditions

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

#### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	General exposures (closed systems): No other specific measures identified. Use as a fuel (closed systems): No other specific measures identified.
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	Bulk product storage: No other specific measures identified. Drum/batch transfers: No other specific measures identified. Bulk transfers: No other specific measures identified.
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	Equipment cleaning and maintenance: No other specific measures identified.
<b>Conditions and measures related to personal protection, hygiene and health evaluations</b>	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.

### 3. Exposure Estimation

#### Environment

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

## Health

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

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

#### Environment

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

#### Health

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

## 8 - Exposure Scenario Worker

### 1. Use as a fuel, Professional

#### List of use descriptors

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

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

##### Product characteristics

<b>Physical state</b>	Liquid. Substance is complex UVCB. Predominantly hydrophobic
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##### Amounts used

<b>Fraction of EU tonnage used in region</b>	0.1
<b>Regional use tonnage</b>	1700000 tonnes/year
<b>Fraction of regional tonnage used locally</b>	0.0005
<b>Annual site tonnage</b>	840 tonnes/year
<b>Maximum daily site tonnage</b>	2300 kg/day

##### Frequency and duration of use

<b>Continuous process</b>	Emission days (days/year): 365
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##### Environment factors not influenced by risk management

<b>Local freshwater dilution factor:</b>	10
<b>Local marine water dilution factor:</b>	100

##### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors			Remarks
		Air	Soil	Water	
initial release prior to RMM	365	0.001	0.00001	0.00001	

##### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	Common practices vary across sites thus conservative process release estimates used.
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##### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

<b>Air</b>	Not applicable.
<b>Soil</b>	Not applicable.
<b>Water</b>	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%): 0. If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%): 0
<b>Sediment</b>	Not applicable.

<b>Organisational measures to prevent/limit release from site</b>	Risk from environmental exposure is driven by freshwater. No wastewater treatment required.
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##### Conditions and measures related to municipal sewage treatment plant

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

<b>Type</b>	Onsite Sewage Treatment Plant
<b>Discharge rate</b>	2000 m <sup>3</sup> /day

<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 3.1e5 kg/d
<b>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)</b>	95.1 %

#### Conditions and measures related to external treatment of waste for disposal

##### Fraction of used amount transferred to external waste treatment

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

#### Conditions and measures related to external recovery of waste

##### Fraction of used amount transferred to external waste treatment

<b>Suitable recover operations</b>	This substance is consumed during use and no waste of the substance is generated.
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### 2.2.1. Contributing scenario controlling worker exposure for Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

#### Product characteristics

<b>Physical form of the product</b>	Liquid With potential for aerosol generation
<b>vapour pressure</b>	Liquid, vapour pressure 0.5 - 10 kPa at Standard Temperature and Pressure

#### Amounts used

Covers percentage substance in the product up to 100 %.

#### Frequency and duration of use

Covers daily exposures up to 8 hours

#### Human factors not influenced by risk management

##### Other given operational conditions affecting workers exposure

Assumes a good basic standard of occupational hygiene is implemented.

##### Other relevant operational conditions

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

#### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	General exposures (closed systems): No other specific measures identified. Use as a fuel (closed systems): No other specific measures identified.
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	Bulk product storage: No other specific measures identified. Bulk transfers: No other specific measures identified. Transfer from/pouring from containers: No other specific measures identified.
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	Equipment cleaning and maintenance: No other specific measures identified.
<b>Conditions and measures related to personal protection, hygiene and health evaluations</b>	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.

### 3. Exposure Estimation

#### Environment

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

## Health

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

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

#### Environment

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

#### Health

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

## 9 - Exposure Scenario Worker

### 1. Use as a fuel, Consumer

#### List of use descriptors

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

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

##### Product characteristics

<b>Physical state</b>	Liquid. Substance is complex UVCB. Predominantly hydrophobic
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##### Amounts used

<b>Fraction of EU tonnage used in region</b>	0.1
<b>Regional use tonnage</b>	76000 tonnes/year
<b>Fraction of regional tonnage used locally</b>	0.0005
<b>Annual site tonnage</b>	38 tonnes/year
<b>Maximum daily site tonnage (kg/day):</b>	100 kg/day

##### Frequency and duration of use

<b>Continuous process</b>	Emission days (days/year): 365
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##### Environment factors not influenced by risk management

<b>Local freshwater dilution factor:</b>	10
<b>Local marine water dilution factor:</b>	100

##### Other given operational conditions affecting environmental exposure

Type	Emission days (days/year)	Emission factors			Remarks
		Air	Soil	Water	
initial release prior to RMM	365	0.001	0.00001	0.00001	

##### Risk management measures (RMM)

<b>Technical conditions and measures at process level (source) to prevent release</b>	Not available.
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	
<b>Air</b>	Not available.
<b>Soil</b>	Not available.
<b>Water</b>	Not available.
<b>Sediment</b>	Not available.
<b>Organisational measures to prevent/limit release from site</b>	Not applicable.

##### Conditions and measures related to municipal sewage treatment plant

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

<b>Type</b>	Municipal Sewage Treatment Plant
<b>Discharge rate</b>	2000 m <sup>3</sup> /day
<b>Treatment effectiveness</b>	95.1 %
<b>Sludge treatment technique</b>	Not available.
<b>Remarks</b>	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal 1.6e4 kg/d

##### Conditions and measures related to external treatment of waste for disposal

## Fraction of used amount transferred to external waste treatment

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

## Conditions and measures related to external recovery of waste

### Fraction of used amount transferred to external waste treatment

<b>Suitable recover operations</b>	This substance is consumed during use and no waste of the substance is generated.
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## 2.2.1. Contributing scenario controlling worker exposure for Fuels

### Product characteristics

<b>Physical form of the product</b>	Liquid.
<b>vapour pressure</b>	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
<b>Process temperature</b>	Assumes activities are at ambient temperature (unless stated differently).

### Amounts used

<b>Liquid: automotive refuelling</b>	< 50000 g Covers percentage substance in the product up to 1 %.
<b>Liquid: home space heater fuel</b>	< 1500 g Covers percentage substance in the product up to 1 %.
<b>Liquid: garden equipment - use</b>	< 1000 g Covers percentage substance in the product up to 1 %.
<b>Liquid: garden equipment - refuelling</b>	< 1000 g Covers percentage substance in the product up to 1 %.

### Frequency and duration of use

	<b>Duration</b>	<b>Frequency of use</b>	<b>Remarks</b>
Liquid: automotive refuelling	< 0.05	52 days per year	(Duration unit = hour)
Liquid: home space heater fuel	< 0.03	365 days per year	(Duration unit = hour)
Liquid: garden equipment - use	< 2	26 days per year	(Duration unit = hour)
Liquid: garden equipment - refuelling	< 0.03	26 days per year	(Duration unit = hour)

### Human factors not influenced by risk management

#### Exposed skin areas

Liquid: automotive refuelling Covers skin contact area up to 210 cm<sup>2</sup>  
Liquid: home space heater fuel Covers skin contact area up to 210 cm<sup>2</sup>  
Liquid: garden equipment - refuelling Covers skin contact area up to 420 cm<sup>2</sup>

### Other given operational conditions affecting workers exposure

<b>Area of use</b>	<b>Room size</b>	<b>Temperature</b>	<b>Ventilation rate</b>	<b>Remarks</b>
Liquid: automotive refuelling	100 m <sup>3</sup>			Outdoor use
Liquid: home space heater fuel	20 m <sup>3</sup>			Indoor use
Liquid: garden equipment - use	100 m <sup>3</sup>			Outdoor use
Liquid: garden equipment - refuelling	34 m <sup>3</sup>			Indoor use

### Other relevant operational conditions

Covers use up to: 0.143 Uses per day Unless otherwise stated.  
Covers exposure up to: 2 hours Unless otherwise stated.

### Risk management measures (RMM)

<b>Technical conditions and measures to control dispersion from source towards the worker</b>	Not available.
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	Not available.

**Conditions and measures related to personal protection, hygiene and health evaluations** Not available.

### **3. Exposure Estimation**

#### **Environment**

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

#### **Health**

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

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

#### **Environment**

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

#### **Health**

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