SECTION 1. SUBSTANCE/MIXTURE AND COMPANY/PLANT IDENTIFICATION

1.1. Product identifier

Trading name:	**Aviation kerosene**
Chemical name	Kerosene (crude oil based)
Other names:	Kerosene desulfurized in an hydrogenic manner; Kerosene - unspecified JET A-1; Jet fuel of a kerosene type; Hydrogenated kerosene
REACH registration number:	01-2119462828-25-0069
Index number:	649-423-00-8
CAS number:	64742-81-0
ES number:	265-184-9
UFI code:	not relevant

1.2. Designated use of the substance or mixture and its unrecommended uses

1.2.1. Designated use

Aviation kerosene is mostly used as a motor fuel for turbojet engines of under sonic as well as supersonic aircraft.

Hydrogenated kerosene is also used as a component for other refinery processing, particularly as a component for mixing motor fuels.

1.2.2. Unrecommended uses

Aviation kerosene must not be used for other purposes than it is specified by the corresponding operation documentation.

1.3. Detailed information about the safety data sheet supplier

1.3.1. Business name and identification number

ORLEN Unipetrol RPA s.r.o., Záluží 1, 436 70 Litvínov, Czech Republic

Business Identification Number: 275 97 075

☎: 420 476 161 111
fax: 420 476 619 553
unipetrolrpa@orlenunipetrol.cz
www.orlenunipetrolrpa.cz

1.3.2. Business location

	Litvínov Refinery	**Kralupy Refinery**
	Záluží 1 436 01 Litvínov	O. Wichterleho 809 278 01 Kralupy n/Vlt.
tel.:	+420 476 163 567	+420 315 718 500
fax:	+420 476 165 086	+420 315 718 640

1.3.3. Email address of the technically competent persons who is responsible for the safety data sheet:

reach.unirpa@orlenunipetrol.cz

1.4. Emergency phone number

- CONTROLroom of ORLEN Unipetrol RPA s.r.o. ☎:+420 476 163 111 (NON STOP)
- Toxicological information center (TIS) ☎:+420 224 919 293 (NON STOP)
  Na bojišti 1, 120 00 Prague 2, Czech Republic ☎:+420 224 915 402 (NON STOP)
  e-mail: tis@vfn.cz
- Transportation information and accident system (TRINS) ☎:+420 476 163 111 (NON STOP)

Note: Emergency phone numbers for the EU countries are included is section 16

SECTION 2. HAZARD IDENTIFICATION

2.1. Substance or mixture classification

The product is classified as hazardous pursuant to Directive (EC) No. 1272/2008 CLP:

FLAMMABLE LIQUID AND VAPOUR, CATEGORY 3; H226	**Flam. liq. 3, H226**
INHALATION HAZARD, CATEGORY 1; H304	**Asp. Tox. 1, H304**
CAUSTICITY/IRRITANT EFFECT, CATEGORY 2, H315	**Skin irit. 2 , H315**
TOXICITY FOR SPECIFIC TARGET ORGANS (ONE-TIME EXPOSURE), CATEGORY 3; H336	**STOT Single Exp. 3, H336**
HAZARDOUS FOR WATER ENVIROMENTS, CATEGORY 2; H411	**Aquatic Chronic 2, H411**

Notice: The full text of the H-statements marked with a code is given in Section 2.2.

2.2. Marking elements

product identifiers		**KEROSENE (CRUDE OIL BASED)** Kerosene - unspecified; JET A-1; Jet fuel of a kerosene type; Hydrogenated kerosene index number: 649-423-00-8
warning hazard symbol		
signal word		HAZARD
H-sentences (standard hazard sentences)	H226 H304 H315 H336 H411	Flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. Toxic to aquatic life with long lasting effects.
P-instructions (safe handling instructions)	P102 P210 P273 P280 P301+P310 P331	Keep out of reach of children. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.
General instructions for placing the product on the consumer market		Only for professional and industrial use.
		ORLEN Unipetrol RPA s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 163 111

2.3. Other hazards

Information if a given substance or mixture complies with the criteria set for PBT or vPvB substances is included in subsection 12.5.

Kerosene is a complex mixture of carbohydrates with a boiling point usually between approximately 135 and 300 °C. It contains aromatic carbohydrates of up to 25% (m/m).

In order to improve its usable characteristics, aviation kerosene can contain suitable additives – for example, antioxidants, conductive additives, lubrication additives, etc., in volumes that do not exceed max. 0.1% (m/m).

Kerosene vapors form an explosive mixture with the air. The product can accumulate static electricity.

The substance is not included in the Candidate List according to Article 59 (1) of the REACH Regulation due to endocrine disrupting properties.

The meaning of abbreviations used in this section is given in Section 16.

SECTION 3. COMPOSITION / INFORMATION ABOUT INDIVIDUAL COMPONENTS

3.1. Substances

substance name:	KEROSENE (CRUDE OIL BASED)
index number (index):	649-423-00-8
CAS number:	64742-81-0
ES number:	265-184-9

NOTE 1: In order to improve its usable characteristics, kerosene can also include various additives - ingredients added with the objective to modify the given usable characteristics, such as additives for improving low-temperature characteristics, lubrication additives, corrosion inhibitors, detergents, etc., in concentrations that do not exceed 0.1% (m/m).

NOTE 2: The substance does not contain nanoform

3.2. Kerosene mixtures

It is a substance

SECTION 4. FIRST AID INSTRUCTIONS

4.1. First aid description

4.1.1. General instructions

When administering first aid, observe your own safety.

Call for the ambulance (☎155 Czech Republic, ☎120 EU) and observe the provided instructions until its arrival. Secure vitally important functions of the victim. If the victim is not breathing normally even when you tilt his/her head back, conduct resuscitation by pressing his/her chest approximately 5 cm deep with a frequency of 100-120 pushes per minute. If you are trained in rescue breathing, execute 2 inhalations after every 30 pushes of the chest. Do not interrupt the heart massage until the ambulance personnel arrives.

Do not give anything to consume to people who are unconscious or who are experiencing cramps. Put them in the recovery position.

4.1.2. Upon inhalation

Transport the victim to fresh air, do not let him/her become cold and seek medical assistance.

4.1.3. Upon contact with skin

Remove the contaminated clothes and footwear. Thoroughly washed the affected spots with water (ideally lukewarm) and soap. Should the irritation symptoms persist, seek professional medial assistance.

Do not remove the product upon being burned. Cover the affected location with a sterile gauze (or clean

fabric) and immediately seek professional medical assistance.

4.1.4. If the products hits eyes

Immediately rinse the eyes by stream of flowing water, open the eyelids (even by force, if necessary); should the victim wear contact lenses, remove them immediately. Seek medical treatment.

4.1.5. Upon ingestion

NEVER INDUCE VOMITING! If the victim is vomiting on his/her own, hold his/her head below his/her hips, thus preventing inhalation of the vomit. Seek medical assistance as fast as possible.

4.2. The most important acute and delayed symptoms and effects

Depending on the exposure dose, the substance can cause headache, nausea, dizziness, breathing difficulties or even breathing stoppages, cramps and unconsciousness. Ingestion can cause vomiting and, as a result of that, the vomit can get into lungs (aspiration) and pulmonary edema can occur (chemical pneumonia), which can result in death. Direct contact with eyes or skin can cause their temporary irritation. Longer exposures of skin to the substance can degrease it.

4.3. Instructions related to immediate medical assistance and special treatment

Should the product hit eyes or enter airways, medical assistance has to be sought immediately.

SECTION 5. FIRE EXTINGUISHING MEASURES

5.1. Fire extinguishers

Suitable fire extinguishers: Air fire extinguishing foam, fire extinguishing powder, CO2.

Unsuitable fire extinguishers: direct water stream.

Extinguishing small fires: powder or foam fire extinguishers, dry sand or fire extinguishing foam.

5.2. Special hazards related to the given substance or mixture

Vapors are heavier than the air and they thus accumulate and spread by the ground. If they leak, they can backfire and subsequently explode and/or cause fire even relatively far from the given leak source. This risk is particularly present below the terrain level and in enclosed areas. Their burning can create toxic and irritating smokes that contain carbon monoxide and unburned carbohydrates.

5.3. Instructions for fire fighters

Limit penetration of the fire extinguishing liquid polluted with the given substance to the sewerage system, surface and underground water and soil to a minimum.

Cool the tanks containing the product with water spray because they can explode due to heat.

Do not use foam and water simultaneously since water decomposes the foam.

Protection equipment for the fire fighters: fully protective clothing and insulation breathing apparatus.

SECTION 6. ACCIDENTAL LEAK MEASURES

6.1. People protection measures, protective equipment and emergency procedures

Seal the accident location and prevent access to the endangered area. Stay on the windward side. Leaks of this product can cause fires. That is why you need to remove all possible ignition sources. Do not smoke and do not handle open flame. If possible, ensure adequate ventilation of the enclosed areas. Prevent contact with the substance and its vapors. When rectifying the given extraordinary event/accident consequences, use all the recommended personal protection equipment (see Subsection 8.2). Evacuate all people from the endangered area in the case of larger accidents. If initiated, the substance vapors below the terrain level and in enclosed areas (including the sewerage system space) can explode.

6.2. Measures for the protection of the environment

Eliminate any further leaks of the substance and fence off the location. Prevent the substances from leaking

into the sewerage system and surface and underground water by covering the sewerage system inlets. Prevent the substance from leaking to soil.

6.3. Methods and material for leak limitation and for cleaning

Leaks of this product can cause fire. That is why you should use lights and electric devices that are of a non-explosive design and non-sparking tools. The leaked product should be collected into a suitable, inflammable porous/absobrent material (such as sand, soil, bergmeal, vermiculite) and removed for liquidation in closed containers. Destroy the product in compliance with the valid legal regulations related to waste (see Section 13).

When the product leaks into water in a relatively high quantity, use catchment immersion walls and gather the product from the water surface using surface collectors (separators) or cover the leaked product using a sorbent and remove the saturated sorbent from the surface by racking or vacuuming. Consult experts prior to using dispersing agents.

6.4. References to other sections

For recommended personal protection aids, see Subsection 8.2 (“Limiting exposure”).
For recommended waste removal procedures, see Section 13 (“Removal instructions”).

SECTION 7. HANDLING AND STORAGE

7.1. Safe handling measures

Handle the substance as well as empty tanks (they can contain product residues) in well ventilated areas and comply with all fire protection measures (no smoking, not working with open flame, removing all possible ignition sources). Do not conduct activities, such as welding, cutting, grinding, etc., in the proximity of the (even empty) packages. Do not use compressed air for filling, emptying or other handling of the tanks. Eliminate static electricity discharges.

General hygienic measures: Observe the personal hygiene rules. Immediately take off polluted parts of your clothing. Do not smoke, drink or eat while working! Thoroughly wash your hands and uncovered parts of your body by water and soap and, if necessary, apply a suitable reparation cream after work and before eating. Do not bring polluted clothes, footwear and protection equipment to eating areas.

7.2. Safe storage conditions for substances and mixtures, including incompatible substances and mixtures

The warehouses have to comply with the given building fire safety requirements and the electric devices have to be in compliance with the valid regulations. Store them in cool, well ventilated areas with adequate exhaust systems outside of the reach of all heat and ignition sources. Storage packages have to be properly closed, marked and grounded. We recommend soft and stainless steel as a suitable package material. Do not store them nearby incompatible materials, such as oxidation agents (oxygen, air, etc.), or other flammable materials.

7.3. Specific final use

Kerosene is mostly used as a motor fuel for compression-ignition combustion engines. Gas oil raffinate can be used only in compliance with the given operation documentation and for the purposes approved in compliance with the valid legislature.
It must not be used as a cleaning agent, for lighting, heating or fire ignition purposes. Never pour the product into the sewerage system.

SECTION 8. LIMITING EXPOSURE / PERSONAL PROTECTION EQUIPMENT

8.1. Control parameters

8.1.1. Limit worksite exposure values

Government Directive No. 361/2007 Coll., which determines the occupational health protection conditions, as amended, specifies the following acceptable exposure limits (PEL) and the highest acceptable concentrations (NPK-P) of chemical substances in the air in the Czech Republic:

Name	CAS number	PEL [mg.m^{-3}]	NPK-P [mg.m^{-3}]	Note
Diesel	-	200	1,000	

Note 1: The meaning of the PEL and NPK-P abbreviations can be found in Section 16.
Note 2: The limit exposure values for the worksites throughout the EU countries are stated in Section 16.

8.1.2. DNEL/DMEL values

DNEL values used for the evaluation:
DNEL (dermal exposure): 15000 µg/kg/day
DNEL (exposure by inhalation): 15000 µg/kg/day or 66.5 mg/m3
PNEC (secondary exposure, oral): 8.77 mg/kg
Note: The meaning of the DNEL and DMEL abbreviations can be found in Section 16.

8.1.3. PNEC values

PNEC (secondary exposure, oral): 8.77 mg/kg
Note: The meaning of the DNEL and DMEL abbreviations can be found in Section 16.

Deriving particular PNEC values based on experimental data acquired by testing the modified water fraction that contains dissolved/emulsified/suspended shares of the tested substance (WAF- "Water accommodated Fraction") is not suitable for UVCB substances of a carbohydrate type. The product environmental risk characteristics were thus determined using the statistic carbon HC5 extrapolation block method utilizing the PETROTOX v.3.05 model.

8.1.4. Recommended procedure for monitoring concentrations at work environments

Recommended procedure for monitoring concentrations at work environments: gas chromatography (GC) with a flame ionization detector (FID) or mass spectrometric detector (MS) pursuant to technical standards ČSN EN 689 and ČSN EN 482.

8.2. Limiting exposure

8.2.1. Technical protection measures for limiting exposure of people and of the environment

Protection against undesirable exposure of people and of the environment has to be ensured by maintaining a strict control over the substance utilizing technical means and procedural and control technologies that reduce emissions and subsequent exposure with the objective to prevent release of the vapors into free space, penetration of the substance in water environments and soil and possible exposure of people. Areas where the substance is handled or stored have to be furnished with impermeable floors and catchment basins for accidental leaks of the substance. Overall and local ventilation and effective exhaust are a must.

8.2.2. Individual protective measures

Should there be a risk of an increased exposure while handling the product or should the exposure increase, for example, as a result of an accident or an extraordinary event, the employees have to have available personal protection equipment (PPE) for the protection of their airways, eyes, hands and skin, which correspond to the character of the conducted activities. They have to be also equipped with a suitable protection of their airways when the used technical means cannot guarantee compliance with the exposure limits specified for the given work environment or when the exposure of their airways could endanger their health. When using the protective equipment continuously while working, appropriate safety breaks have to be included, provided the character of the given PPE requires it. All PPE has to be continuously maintained in a usable condition. Should it become damaged or polluted, it has to be replaced immediately.

RECOMMENDED PERSONAL PROTECTION EQUIPMENT (PPE):
(particular types of the protective equipment have to be chosen based on the type of the conducted activity and based on the quantity and concentration of the given hazardous substance/mixture at the worksite)

- ***airways protection:*** protective mask that complies with EN 140 with a filter that is effective against the effects of organic vapors for areas with insufficient ventilation

and/or local exhaust system; insulation breathing apparatus for rectifying the consequences of extraordinary events/accidents;

- ***eyes / face protection:*** protective goggles that comply with EN 166;
- ***hands protection:*** chemically resistant gloves tested pursuant to EN 374; the following are some of the suitable materials:

	glove material	*layer thickness*	*penetration time*
common work activities (staining possibility)	natural latex	1 mm	120 minutes
leak / accident repair	nitrile	0.4 mm	480 minutes

- ***protection of other body parts:*** antistatic and inflammable clothes, antistatic footwear;
- ***heat hazard:*** irrelevant when used as specified.
- ***other measures:*** we recommend to furnish the worksite with a safety shower and an eye rinsing mechanism.

8.2.3. Limiting the exposure of the environment

Prevent product leaks to the environment by employing all available means. See Section 6.2.

SECTION 9. PHYSICAL AND CHEMICAL CHARACTERISTICS

9.1. Information about the basic physical and chemical characteristics

The information has been adopted from the corresponding registration documentation, unless stated otherwise.

attribute	unit	value	source/method	note
state of matter		liquid	CSR	at 20°C
colour		colorless, slightly yellowish	CSR	
odour		typically kerosene	CSR	
melting point / freezing point	[°C]	<-49	CSR	
initial boiling point / boiling point range	[°C]	90-320	CSR	influence of variable composition of UVCB
flammability		flammable liquid	CSR	
upper explosive limit	%	6,5	GESTIS	CSR does not state
lower explosive limit	%	0,6	GESTIS	CSR does not state
flash point	[°C]	29-70	CSR	
spontaneous ignition temperature	[°C]	220-250	CSR	

attribute	unit	value	source/method	note
decomposition temperature		does not decompose at normal operating temperatures		CSR does not state
pH		not relevant (non-polar substances)		CSR does not state
viscosity kinematic	[$mm^2.s^{-1}$]	2,8-4,3	CSR	at -20°C
solubility in water	[$mg.l^{-1}$]	slight		CSR does not state
relative density	water=1	0,77-0,85	CSR	at 15°C
distributive coefficient: n-octanol/water	[log Koc]	1,71 – 14,7	CSR	
vapour pressure	[Pa]	1,0-3,7	CSR	at 37,8°C
relative vapour density	air=1	4,5	ICSCs	CSR does not state
particle characteristics		-		not applicable - it is a liquid

9.2. Other information

9.2.1. Information concerning physical hazard classes
Flammable liquid and vapor

9.2.2. Other security features
They are not available.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

The product is stable under normal conditions.

10.2. Chemical stability

The product is stable under normal conditions.

10.3. Possibility of hazardous chemical reactions

It can release carbon monoxide when burning in an environment with a lack of oxygen.

10.4. Conditions that have to be avoided

Concentrations within the explosion limits, presence of ignition sources, contact with open flame.

10.5. Incompatible materials

Oxidation agents.

10.6. Hazardous disintegration products

None under normal conditions; carbon monoxide and soot can be created when burning in an environment with a lack of oxygen.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information about toxicological effects

11.1.1. Toxicological effects of the substance/mixture

HAZARD CLASS	DATA FROM THE REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Acute toxicity	oral (OECD 401): inhalation (OECD 403): dermal (OECD 404):	LD_{50} = 5000 mg/kg LC_{50} = 5280 mg/m^3 LD_{50} = 2000 mg/kg	it does not comply with the classification criteria
Causticity / irritant effect for skin	product tests and tests of the included components (OECD 404)	3.46	it complies with the classification criteria
Serious damage / eye irritation	product tests and tests of the included components (OECD 405)	-	it does not comply with the classification criteria
Sensibility	product tests and tests of the included components (OECD 406)	the product and its components do not cause allergic reactions	it does not comply with the classification criteria
Mutagenicity in reproductive cells	OECD 476	based on the included components, the substance is not assessed as possibly toxic for reproduction abilities.	it does not comply with the classification criteria
Carcinogenicity	tests	Based on the acquired data, kerosene is assessed as not carcinogenic.	it does not comply with the classification criteria
Toxic for reproduction	1/ fertility: 2/ prenatal development toxicity:	There are no data available, which would suggest that the substance is toxic for reproduction	it does not comply with the classification criteria
STOT – one-time exposure	acute toxicity tests (oral, dermal, inhalation)	Affected organs: Central nervous system Exposure manner: Inhalation	it complies with the classification criteria
STOT – repeated exposure	1/ oral: 2/ inhalation: 3/ dermal	NOAEL: 750 mg/kg bw/day	it does not comply with the classification criteria

HAZARD CLASS	DATA FROM THE REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Inhalation hazard		when the product is ingested or when it enters the airways while its kinematic viscosity is below 20.5 mm^2/s (40 °C), it damages lungs and can cause death	it complies with the classification criteria

11.1.2. Information about probable exposure ways
The exposure can occur by inhalation, accidental ingestion or penetration of individual components through skin.

11.1.3. Symptoms and effects (acute, delayed and chronic after short-term as well as long-term exposure)
Depending on the exposure dose, the substance can cause headaches, sore throat, cough, breathing difficulties, chest pressure, disturbances of the central nervous system, nausea, sleepiness and dizziness. The related difficulties can be demonstrated by belly cramps, spontaneous vomiting or diarrhea. Direct contact with eyes or skin can cause temporary irritation manifested by reddening or swelling of the affected spot, or eye tearing, reddening and swelling. Longer exposures of skin to the substance can degrease it and cracks can appear. The substance can cause or support creation of cancer. When handling the hot (heated) product, you can get burned, which is usually manifested by hurting and reddening of your skin or, in more serious cases, by blisters.

11.1.4. Interactive effects
No interactions occur if the product is used appropriately.

11.2. Information on other hazards
The Substance is not included in the Candidate List under Article 59 (1) of the REACH (due to endocrine disrupting properties or for any other reason).

SECTION 12. ENVIRONMENTAL INFORMATION

12.1. Toxicity

Water environment	fish	LL_{50} (96 h, fish) = 2.0-100.0 mg/l	Oncorhynchus mykiss)
	invertebrates	EL_{50} (48 h, invertebrates) = 1.9-89 mg/l	Daphnia magna
	seaweed	EL_{50} (72 h, seaweed) = 10-30 mg/l	Selenastrum capricornutum
Microbiological activity (waste water treatment plant)	activated sludge	The substance is a UVCB carbohydrate. The standard tests have been designated for individual substances and are suitable for assessing risks of this complex substance. In order to assess individual risks, the sediment PNEC for carbohydrate substances were derived using water PNEC and the balanced partition method (EqP), utilizing representative structures.	

Note: Significance of the EL_{50} and LL_{50} abbreviations is included in Section 16.

12.2. Persistence and degradability
The assessment of the representative carbohydrate structures indicates some structures that can comply with the P or vP criteria.

Biodegradability pursuant to CEC approximately 50 – 60%.
Because of the complex composition of this substance, its potential biodegradability cannot be estimated using quantitative models of the relations between the structure and biodegradability.

12.3. Bioaccumulation potential
The assessment of the representative carbohydrate structures indicates some structures that can comply with the B criteria, but none that can comply with the vB criteria.

12.4. Mobility in the soil
Log Koc values were calculated for individual product components. They range between 1.71 and 14.70.

12.5. PBT and vPvB assessment results
It is not suitable to compare this UVCB substance of a hydrocarbon type with the criteria pursuant to Appendix XIII to Directive (EC) No. 1907/2006 REACH, as a whole. That is why individual components were assessed with the conclusion that the product complies neither with the persistence, bioaccumulation and toxicity criteria, nor with the high persistence and high bioaccumulation criteria pursuant to Appendix XIII to Directive (EC) No. 1907/2006 REACH. That is the reason why the product is not identified as a PBT substance (P-persistent, B-bioaccumulating, T-toxic) or vPvB substance (vP-highly persistent, vB-highly bioaccumulating).

12.6. Endocrine disrupting properties
The Substance is not included in the Candidate List under Article 59 (1) of the REACH due to endocrine disrupting properties.

12.7. Other negative impacts
It creates a homogenous layer on water surface, which prevents oxygen access. Pursuant to Appendix 1 to Water Act No. 254/2001 Coll., the product is considered hazardous and harmful substance.
It does not contain ozone-harming substances pursuant to the Montreal Protocol and its Copenhagen Amendment.

SECTION 13. REMOVAL INSTRUCTIONS

13.1. Waste management methods
When product residues need to be removed (for example, unused or leaked product), the valid European Union legislature, national legislature and valid local regulations have to be observed. Hand the waste over for removal to an appropriately qualified person with the appropriate authorization.

Recommended waste classification pursuant Decision 2000/532 / EC on the list of wastes covered by Directive of the European Parliament and of the Council (Waste Catalogue)

13.1.1. Catalogue number

Catalogue number for the product that has become waste:

13 07 01* Heating oil and motor diesel

07 01 04* Other organic solvents, washing liquids and mother lyes.

16 03 05* Organic waste containing dangerous substances

Catalogue number for the leaked product absorbed by an absorption agent (such as vapex):

15 02 02*Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances.

Catalogue number for soil polluted with the leaked product:

17 05 03* Soil and stones containing dangerous substances.

13.1.2. Recommended waste removal method

Hand the unused product residues over for removal to an appropriately qualified person with the appropriate authorization. Recommended removal method: Energy utilization (combustion).

13.1.3. Substance liquidation methods

Waste and unused residues are liquidated in compliance with the valid waste legislature, usually by incineration in incineration plants designed for this purpose. Disposal to dump sites is not suitable.

13.1.4. Contaminated packaging liquidation methods

Kerosene is usually supplied in railroad cars or road tankers. Decontamination and liquidation of such packaging material is governed by the ADR/RID regulations.

NOTE: the stated information applies to the delivered, still unused material. Should an already used material become waste, it is up to the waste originator to assign a code to it pursuant to the given field and usage process and to determine its liquidation method.

SECTION 14. TRANSPORT INFORMATION

14.1. UN number or ID-number

1863

14.2. Official (UN) transport name

FUEL FOR JET ENGINES

14.3. Transport hazard class/classes

3

14.4. Packaging group

III

14.5. Environmental hazard

ENDANGERING THE ENVIRONMENT

ENVIRONMENTALLY HAZARDOUS

14.6. Special safety measures for the users

None.

14.7. Maritime bulk transport according to IMO instruments

Irrelevant. The product is transported in railway tankers, road tankers or via pipelines.

14.8. Other information

Hazard number:	30
Classification code:	F1
Safety symbol:	3

SECTION 15. REGULATION INFORMATION

15.1. Regulations related to safety, health and the environment / specific legal regulations related to the given substance or mixture

15.1.1. European Union

EP and Council (EC) Directive No. 1907/2006 (REACH) as amended

REGISTRATION (HEAD II OF THE REACH DIRECTIVE):

the product components have been fully registered as the substance

APPROVAL PROCESS (HEAD VII OF THE REACH DIRECTIVE)

the product components are not listed on the list of substances included in Appendix XIV of Directive (EC) No. 1907/2006 REACH and the approval obligation thus does not apply to them

LIMITATIONS (HEAD VIII OF THE REACH DIRECTIVE):

the product must not be placed on the market for being sold to the public, with the exception of

cosmetic products, medicines and fuels defined in more detail in record 28 of Appendix XVII of Directive (EC) No. 1907/2006 REACH

EP and Council (EC) Directive No. 1272/2008 (CLP), as amended

the product has been classified in compliance with the above stated directive; the obligations related to packaging and package marking of hazardous chemical substances apply to the product only if it is put on the market in packages that are subject to the marking obligation pursuant to Directive CLP

EP and Council (EC) Directive No. 649/2012 on exporting and importing hazardous chemical substances, as amended

the product is not subject to any special export or import limitations

Decision 2000/532 / EC on the list of wastes covered by Directive of the European Parliament and of the Council

15.1.2. Czech Republic

Act No. 350/2011 Coll. on chemical substances and chemical mixtures, as amended

the product has been registered in the CHLAP system

Act No. 258/2000 Coll., on Protection of Public Health, as amended

the obligation to prepare corresponding Handling Rules applies to the product

Act No. 254/2001 Coll., on Waters, as amended

Act No. 201/2012 Coll., on Air Protection, as amended

Act No. 541/2020 Coll., on Waste, as amended

Regulation No. 93/2016 Coll., on the Waste Catalogue, as amended

Government Directive No. 361/2007 Coll., which determines occupational health protection conditions, as amended

Act No. 224/2015 Coll., on prevention of serious accidents caused by selected dangerous chemicals or chemical mixtures, as amended

15.2. Chemical safety assessment

The chemical safety assessment was conducted as a part of the substance registration process. The substance complies with the classification criteria for hazardous substances pursuant to Directive (EC) No. 1272/2008 CLP. Exposure assessment as well as the subsequent risk characterization step have been conducted.

SECTION 16. OTHER INFORMATION

Changes made during the revision

Changes in this version of the safety data sheet are indicated by a black and red vertical line to the left of the text.

24.4.2023 In section 9, the term “ignition point” was replaced by the term “flash point”.

Abbreviated words and abbreviations used in the text

ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
CAS	Registration number assigned by the “Chemical Abstracts Service“ of the ”American Chemical Society“
CLP	Directive (EC) No. 1272/2008 on Classification, Labelling and Packaging of Chemical Substances and Mixtures, implemented into the European legislature by GHS (United Nations´ Globally Harmonized System)
CMR	Carcinogenic, mutagenic or toxic for reproduction
ČSN EN (ISO)	European standard incorporated into the system of the Czech technical standards
CSR	Chemical Safety Report
DMEL	Exposure level that corresponds to a low and possibly theoretical risk, which should be considered an acceptable risk (for threshold-less effects, i.e. no exposure level without an effect exists)

DNEL	Exposure level derived from toxicological data, during which no negative impacts on the health of people occur
DW	Data waiving
EC_{50}	Effect concentration that results in immobilization of 50% of individuals
ErC_{50}	Effect concentration that results in a 50% reduction of the seaweed growth speed
ECHA	European Chemicals Agency
EL_{50}	Effective loading speed that is necessary for a 50% immobilization
ES	Official number of the chemical substance in the European Union: EINECS from the European Inventory of Existing Commercial Substances, or ELINCS from the European List of Notified Chemical Substances, or NLP from the "No Longer Polymer" list of substances
HSDB	Hazardous Substances Data Bank
IATA	International Air Transport Association
IBC	International regulation for the construction and equipment of boats that transport hazardous chemicals in bulk ("Intermediate Bulk Container")
IC_{50}	Inhibition concentration that results in inhibition of 50% of individuals
ICAO	International Civil Aviation Organization
ICE	"Intervention in Chemical Transport Emergencies" program
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organisation
ISO	International Organization for Standardization
LC_{50}/LD_{50}	Lethal concentration/level that results in death of 50% of individuals
LL_{50}	Introduction speed of the tested substance that results in a 50% mortality rate
LOEC/LOEL	Lowest Observed Effect Concentration/Level
log Koc	Logarithm for the partition coefficient of carbon and water in soil
log Kow	Logarithm for the n-octanol/water partition coefficient
MARPOL	International convention on preventing pollution from boats
nf	Not feasible
NOAEC/NOAEL	Highest "no observed adverse effect concentration/level"
NOEC/NOEL	Highest "no observed effect concentration/level"
NPK-P	Highest acceptable chemical substance concentration in the air (substance concentration that employees can be exposed for a maximum of 15 minutes; nevertheless, this concentration must never be exceeded)
OECD	Organization for Economic Co-operation and Development
PPA	Personal protective aids
UN	United Nations
(Q)SAR	Theoretical mathematic model, using of which can be used for determining the given substance characteristics based on the chemical substance structure and activity ("Quantitative Structure-Activity Relationship")

PBT, vPvB	Persistent, bioaccumulative and toxic, highly persistent and highly bioaccumulative
PEL	Acceptable exposure limit of a given chemical substance in the air (exposure value that employees can be exposed to during the entire shift time (8 hours) even all their lives without endangering their health)
PNEC	Estimated concentration, during which hazardous effects in the given environmental component do not occur
REACH	Directive (EC) No. 1907/2006 on the Registration, Evaluation and Authorisation of Chemicals
RID	Regulation Concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STOT	Specific Target Organ Toxicity
SU	Scientifically Unjustified
TRINS	Transportation information and accident system
UACRON	Chemical database (The University of Akron).
UN number	Four-digit substance or item identification number adopted from the UN ample regulations
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials

Data sources used for preparing safety data sheets

Appendixes I, IV, VI and VII to Directive (EC) No. 1272/2008 CLP, as amended
First aid principles upon exposure to chemical substances (doc. MUDr. Daniela Pelclová and col.)
Registration documentation of the substances pursuant to Directive (EC) No. 1907/2006 REACH
Decision of the European Agency for Chemical Substances ECHA No. SUB-D-2114173889-27-01/F on the registration pursuant to Directive (EC) No. 1907/2006 REACH

Training instructions

People who handle the product have to be acquainted with the related handling risks and with the requirements related to the protection of health and of the environment (see the corresponding stipulations of the Labor Code).

Access to information

Pursuant to Article 35 of Directive (EC) No. 1907/2006 REACH, all employers have to allow access to the information stated on the safety data sheets to all employees who use the given product or who are exposed to its effects while working, as well as to representatives of these employees.

Limit worksite exposure values for the EU countries (see Point 8.1.1)

motor diesel data (CAS number 68334-30-5)

Name	Country	8-hour limit [mg.m^{-3}]	short-term limit [mg.m^{-3}]
Gas oil	European Union (Regulation 2000/39/ES)	**no limit values for the given substances have been defined**	
	Hungary		
	Germany		
	Poland		

8-hour limit: *measured and calculated value in relation to an eight-hour reference period as a time-weighted average*
short-term limit: *exposure limit value, which should not be exceeded and which corresponds to 15 minutes*

Emergency phone numbers for the EU countries (see Section 1.4)

National centers (NON STOP)		**TOXICOLOGY (first aid information)**	**ICE (SDS information)**	
Belgium		☎+32/70245245	Belintra	☎+32/35699232
Bulgaria		☎+359/29154378		
Croatia		☎+385/12348342		
Czech Republic		☎+420/224-919293; 915402	TRINS	☎+420/47 6163111; 6163267
Denmark		☎+45/82121212	PIBF/RVK	☎+45/45906000
Estonia		☎+372/6269379		
Finland		☎+358/9471977		
France		☎+33/(0)140054848	Transaid	☎+33/298331010
Ireland		☎+353/18092566		
Italy		☎+39/063054343	SET	☎+39/0362512868
Cyprus		☎+357/1401		
Lithuania		☎+370/52362052		
Latvia		☎+371/67042473		
Luxembourg		☎+32/70245245 (see Belgium)		
Hungary		☎+36/80201199	VERIK	☎+36/23552205

National centers (NON STOP)		TOXICOLOGY (first aid information)	ICE (SDS information)	
Malta		☎+356/21450000		
Germany		☎+49/3019240	TUIS	☎+49/6216043333
Holland		☎+31/302748888	TRC	☎+31/102468642
Poland		☎+48/226196654	SPOT	☎+48/243657032
Portugal		☎+351/808250143		
Austria		☎+43/14064343	TUIS	☎+49/6216043333
Greece		☎+30/2107793777		
Romania		☎+40/212106282		
Slovakia		☎+421/254774166	DINS	☎+421/317754112; 2771
Slovenia		☎+386/41635500		
Spain		☎+34/915620420	CERET	☎+34 915373 248; 238
Sweden		☎+46/(0)104566700	KEMIAKUTEN	☎+46/8337043; 170970
Great Britain		☎ 8448920111	Chemsafe	☎+44/123 5836002; 5753363

Declaration: The safety data sheet has been prepared in compliance with Directive (EC) No. 1907/2006 REACH. It contains information that is necessary for ensuring occupational health and safety and protection of the environment. This information has been stated in good spirits, it corresponds to the current level of knowledge and experience and complies with our valid legal regulations. The stated information does not replace the corresponding qualitative specification and it cannot be considered a guarantee of suitability and usability of this product for a particular application. It is the responsibility of the product user to assess accuracy of the information for particular applications, during which the product characteristics can be influenced by various factors. The consumer is responsible for complying with the valid regional legal regulations.

APPENDIX TO THE SAFETY DATA SHEET

EXPOSURE SCENARIO PURSUANT TO ARTICLE 31 OF DIRECTIVE OF THE EUROPEAN PARLIAMENT AND COUNCIL (EC) NO. 1907/2006 (REACH)

The appendix includes exposure scenarios applied from Chapter 9 of the Chemical Safety Report submitted as a part of the kerosene registration process, which have been prepared for kerosene production and its identified uses.

The revision of the Exposure Assessments below originates from ECHA Final Decisions. The issues addressed in these Decisions Appendix **Response to Final Decisions from ECHA to update the PNECs** attached in IUCLID Section 13.

9. EXPOSURE ASSESSMENT

IU	Category	Identified Use	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
1	Kerosine	01 – Manufacture of Substance	Manufacture	ES 9.1.1	NA	NA	1, 2, 3, 4, 8a, 8b, 15	NA	1	ESVOC SpERC 1.1.v1
2	Kerosine	01b – Use of Substance as Intermediate	Industrial	ES 9.2.1	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	NA	6a	ESVOC SpERC 6.1a.v1
3	Kerosine	01a – Distribution of Substance	Industrial	ES 9.3.1	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 15	NA	4, 5, 6a, 6b, 6c, 6d, 7	ESVOC SpERC 1.1b.v1
4	Kerosine	02 – Formulation & (Re)packing of Substances and Mixtures	Formulation	ES 9.4.1	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	NA	2	ESVOC SpERC 2.2.v1
5	Kerosine	03a – Uses in Coatings: Industrial	Industrial	ES 9.5.1	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 15	NA	4	ESVOC SpERC 4.3a.v1
6	Kerosine	03b – Uses in Coatings: Professional	Professional	ES 9.6.1	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	NA	8a, 8d	ESVOC SpERC 8.3b.v1

IU	Category	Identified Use	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
7	Kerosine	03c – Uses in Coatings: Consumer	Consumer	ES 9.7.1	NA	1, 4, 9a, 9b, 9c, 15, 18, 23, 24, 31, 34	NA	NA	8a, 8d	ESVOC SpERC 8.3c.v1
8	Kerosine	04a – Use in Cleaning Agents: Industrial	Industrial	ES 9.8.1	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	NA	4	ESVOC SpERC 4.4a.v1
9	Kerosine	04b – Use in Cleaning Agents: Professional	Professional	ES 9.9.1	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	NA	8a, 8d	ESVOC SpERC 8.4b.v1
10	Kerosine	04c – Use in Cleaning Agents: Consumer	Consumer	ES 9.10.1	NA	3, 4, 8 (Excipient only), 9a, 24, 35, 38	NA	NA	8a, 8d	ESVOC SpERC 8.4c.v1
11	Kerosine	06a – Lubricants: Industrial	Industrial	ES 9.11.1	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18	NA	4, 7	ESVOC SpERC 4.6a.v1
12	Kerosine	06b – Lubricants: Professional (Low Release)	Professional	ES 9.12.1	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	NA	9a, 9b	ESVOC SpERC 9.6b.v1
13	Kerosine	06c – Lubricants: Professional (High Release)	Professional	ES 9.13.1	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	NA	8a, 8d	ESVOC SpERC 8.6c.v1
14	Kerosine	06d – Lubricants: Consumer (Low Release)	Consumer	ES 9.14.1	NA	1, 24, 31	NA	NA	9a, 9b	ESVOC SpERC 9.6d.v1

IU	Category	Identified Use	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
15	Kerosine	06e – Lubricants: Consumer (High Release)	Consumer	ES 9.15.1	NA	1, 24, 31	NA	NA	8a, 8d	ESVOC SpERC 8.6e.v1
16	Kerosine	07a – Use in Metal Working Fluids / Rolling Oils: Industrial	Industrial	ES 9.16.1	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17	NA	4	ESVOC SpERC 4.7a.v1
17	Kerosine	07b – Use in Metal working fluids / rolling oils: Professional	Professional	ES 9.17.1	NA	NA	1, 2, 3, 5, 8a, 8b, 9, 10, 11, 13, 17	NA	8a, 8d	ESVOC SpERC 8.7c.v1
18	Kerosine	10a – Use as Release Agents or Binders: Industrial	Industrial	ES 9.18.1	NA	NA	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14	NA	4	ESVOC SpERC 4.10a.v1
19	Kerosine	10b – Use as Release Agents or Binders: Professional	Professional	ES 9.19.1	NA	NA	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14	NA	8a, 8d	ESVOC SpERC 8.10b.v1
20	Kerosine	11a – Use in Agrochemicals: Professional	Professional	ES 9.20.1	NA	NA	1, 2, 4, 8a, 8b, 11, 13	NA	8a, 8d	ESVOC SpERC 8.11a.v1
21	Kerosine	11b – Use in Agrochemicals: Consumer	Consumer	ES 9.21.1	NA	12, 27	NA	NA	8a, 8d	ESVOC SpERC 8.11b.v1
22	Kerosine	12a – Use as a Fuel: Industrial	Industrial	ES 9.22.1	NA	NA	1, 2, 3, 8a, 8b, 16	NA	7	ESVOC SpERC 7.12a.v1
23	Kerosine	12b – Use as a Fuel: Professional	Professional	ES 9.23.1	NA	NA	1, 2, 3, 8a, 8b, 16	NA	9a, 9b	ESVOC SpERC 9.12b.v1

IU	Category	Identified Use	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
24	Kerosine	12c – Use as a Fuel: Consumer	Consumer	ES 9.24.1	NA	13	NA	NA	9a, 9b	ESVOC SpERC 9.12c.v1
25	Kerosine	13a – Use as Functional Fluids: Industrial	Industrial	ES 9.25.1	NA	NA	1, 2, 3, 4, 8a, 8b, 9	NA	7	ESVOC SpERC 7.13a.v1
26	Kerosine	15 – Use in Road and Construction Applications: Professional	Professional	ES 9.26.1	NA	NA	8a, 8b, 9, 10, 11, 13	NA	8d, 8f	ESVOC SpERC 8.15.v1
27	Kerosine	18b – Explosives Manufacture & Use: Professional	Professional	ES 9.27.1	NA	NA	1, 3, 5, 8a, 8b	NA	8e	ERC DEFINED RELEASE FRACTIONS

The process of mapping uses and characterising risks has often identified a series of supporting measures that may further contribute to the management of exposure. The measures are identified in *blue* text in the Appendices contained in section 10. These measures are not contained within the Exposure Scenarios (ES) as they do not need to be implemented in order to achieve satisfactory exposure control. However, they are identified within the CSA in order that stakeholders are able to benefit from access to other exposure control information that has been obtained during the process of CSA/ES development.

9.1 Manufacture of Substance

9.1.1 Exposure Scenario

Section 1 Exposure Scenario Manufacture of Substance Title

Manufacture of Substance

Use Descriptor

Sector(s) of Use	NA
Process Categories	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Categories	1
Specific Environmental Release Category	ESVOC SpERC 1.1.v1

Processes, tasks, activities covered

Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling / recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Assessment Method

See Section 3.

Section 2 Operational conditions and risk management measures

Section 2.1 Control of worker exposure Product characteristics

Physical form of product Liquid

Vapour pressure (kPa)	Liquid, vapour pressure 0.5 - 10 kPa at STP. OC4.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1.

Contributing Scenarios Specific Risk Management Measures and Operating Conditions

General measures	(skin irritants) G19

	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.
CS15 General exposures (closed systems)	Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3 No other specific measures identified.
CS16 General exposures (open systems)	EI20 No other specific measures identified. EI20

CS14 Bulk transfers No other specific measures identified. EI20 CS2 Process sampling No other specific measures identified. EI20

CS36 Laboratory activities No other specific measures identified. EI20

CS39 Equipment cleaning and maintenance No other specific measures identified. EI20

CS85 Bulk Product Storage No other specific measures identified. EI20

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	6.4E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	6.0E+5
Maximum daily site tonnage (kg/day)	2.0E+6
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0E-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0E-4
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required [TCR14].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%)	99.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	92.6
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	99.6
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	2.0E+6
Assumed domestic sewage treatment plant flow (m^3/d)	10000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated. [ETW4]	

Conditions and measures related to external recovery of waste
During manufacturing no waste of the substance is generated. [ERW2]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. 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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4]. Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – "Site-Specific Production" worksheet [DSU6]. The Tier 1 analysis demonstrates that no refineries have RCRs > 1.

9.1.2 Exposure Estimation

9.1.2.1 Human Health

See Appendix 2.a and 2.b.

9.1.2.2 Environment

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

9.2 Use of Substance as Intermediate– Industrial

9.2.1 Exposure Scenario

Section 1 Exposure Scenario Use of Substance as Intermediate Title

Use of Substance as Intermediate

Use Descriptor

Sector(s) of Use	8, 9
Process Categories	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Categories	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1

Processes, tasks, activities covered

Use of substance as an intermediate (not related to strictly controlled conditions) within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Assessment Method

See Section 3.

Section 2 Operational conditions and risk management measures

Section 2.1 Control of worker exposure
Product characteristics

Physical form of product Liquid

Vapour pressure (kPa)	Liquid, vapour pressure 0.5 - 10 kPa at STP. OC4.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1.

Contributing Scenarios Specific Risk Management Measures and Operating Conditions

General measures (skin irritants) G19	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 skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20 No other specific measures identified. EI20
CS16 General exposures (open systems)	
CS14 Bulk transfers	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20

CS85 Bulk Product Storage	No other specific measures identified. EI20
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.9E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.5E+4
Maximum daily site tonnage (kg/day)	5.0E+4
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0E-3
Release fraction to wastewater from process (initial release prior to RMM)	3.0E-4
Release fraction to soil from process (initial release prior to RMM)	0.001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required [TCR14].	
Treat air emission to provide a typical removal efficiency of (%)	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%)	97.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	41.1
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.0
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	5.0E+4
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	

This substance is consumed during use and no waste of the substance is generated. [ETW5]
Conditions and measures related to external recovery of waste
This substance is consumed during use and no waste of the substance is generated. [ERW3]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. 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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

9.2.2 Exposure Estimation

9.2.2.1 Human Health

See Appendix 2.a and 2.b.

9.2.2.2 Environment

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

9.3 Distribution of Substance– Industrial

9.3.1 Exposure Scenario

Section 1 Exposure Scenario Distribution of Substance Title

Distribution of Substance	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Categories	4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1

Processes, tasks, activities covered

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

Assessment Method

See Section 3.

Section 2.1 Control of worker exposure Product characteristics

Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure 0.5 - 10 kPa at STP. OC4.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1

Contributing Scenarios Specific Risk Management Measures and Operating Conditions

General measures (skin irritants) G19	CS15 General exposures (closed systems) CS16 General exposures (open systems)

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 skin contamination	immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3 No other specific measures identified.
	EI20 No other specific measures
	identified. EI20

CS2 Process sampling No other specific measures identified. EI20 CS36 Laboratory activities No other specific measures identified. EI20 CS14 Bulk transfers No other specific measures identified. EI20

CS6 Drum and small package filling CS39 Equipment cleaning and maintenance	No other specific measures identified.
	EI20 No other specific measures
	identified. EI20

CS85 Bulk Product Storage No other specific measures identified. EI20

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	8.7E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.7E+4
Maximum daily site tonnage (kg/day)	5.8E+4
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0E-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0E-5
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%)	23.8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95.0
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	8.8E+5
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	

External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1}
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. 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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

9.3.2 Exposure Estimation

9.3.2.1 Human Health

See Appendix 2.a and 2.b.

9.3.2.2 Environment

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

9.4 Formulation & (Re)packing of Substance– Industrial

9.4.1 Exposure Scenario

Section 1 Exposure Scenario Formulation & (Re)packing of Substance Title

Formulation & (Re)packing of Substances and Mixtures

Use Descriptor

Sector(s) of Use

Process Categories 1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15

Environmental Release Categories 2

Specific Environmental Release Category ESVOC SpERC 2.2.v1

Processes, tasks, activities covered

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities **Assessment Method**

See Section 3.

Section 2 Operational conditions and risk management measures

Section 2.1 Control of worker exposure Product characteristics

Physical form of product Liquid

Vapour pressure (kPa)	Liquid, vapour pressure 0.5 - 10 kPa at STP. OC4.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1

Contributing Scenarios Specific Risk Management Measures and Operating Conditions

General measures (skin irritants) G19

	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.
CS15 General exposures (closed systems)	Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3 No other specific measures identified.
CS16 General exposures (open systems)	EI20 No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers	No other specific measures identified. EI20
CS30 mixing operations (open systems)	No other specific measures identified. EI20
CS34 Manual / CS22	No other specific measures identified. EI20

Transfer from/pouring from containers.	
CS8 Drum/batch transfers	No other specific measures identified. EI20
CS100 Tabletting, compression, extrusion or pelletisation	No other specific measures identified. EI20
CS6 Drum and small package filling	No other specific measures identified. EI20
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20
CS85 Bulk Product Storage	No other specific measures identified. EI20

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	6.8E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	3.0E+4
Maximum daily site tonnage (kg/day)	1.0E+5
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (*after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements*)	1.0E-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0E-4
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required [TCR14].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%)	97.8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	55.8
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	

Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.8
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	1.0E+5
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1}	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
4.2. 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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

9.4.2 Exposure Estimation

9.4.2.1 Human Health

See Appendix 2.a and 2.b.

9.4.2.2 Environment

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

9.22 Use as a Fuel– Industrial

9.22.1 Exposure Scenario

Section 1 Exposure Scenario - Use as a Fuel

Industrial Title

Use as a Fuel Industrial

Use Descriptor

Sector(s) of Use

Process Categories 1, 2, 3, 8a, 8b, 16

Environmental Release Categories 7

Specific Environmental Release Category ESVOC SpERC 7.12a.v1

Processes, tasks, activities covered

Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Assessment Method

See Section 3.

Section 2 Operational conditions and risk management measures

Section 2.1 Control of worker exposure

Product characteristics

Physical form of product Liquid

Vapour pressure (kPa) Liquid, vapour pressure 0.5 - 10 kPa at STP. OC4.

Concentration of substance in product Covers percentage substance in the product up to 100 % (unless stated differently) G13

Frequency and duration of use/exposure Covers daily exposures up to 8 hours (unless stated differently) G2

Other Operational Conditions affecting exposure Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1

Contributing Scenarios Specific Risk Management Measures and Operating Conditions

General measures (skin irritants) G19.	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 skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems) GEST_12I Use as a fuel, CS107 (closed systems)	No other specific measures identified. EI20 No other specific measures identified. EI20

CS14 Bulk transfers No other specific measures identified. EI20 CS8 Drum/Batch transfers No other specific measures identified. EI20

CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20

CS85 Bulk Product Storage No other specific measures identified. EI20

Section 2 . 2 Control o f environmental exposure

Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.6E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.5E+6
Maximum daily site tonnage (kg/day)	5.0E+6
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0E-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required [TCR14].	
Treat air emission to provide a typical removal efficiency of (%)	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%)	99.1
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	82.3
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	99.1
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	5.0E+6
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2]. External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	

This substance is consumed during use and no waste of the substance is generated. [ERW3]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. 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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

9.22.2 Exposure Estimation

9.22.2.1 Human Health

See Appendix 2.a and 2.b.

9.22.2.2 Environment

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

9.23 Use as a Fuel– Professional

9.23.1 Exposure Scenario

Section 1 Exposure Scenario - Use as a Fuel

Professional Title

Use as a Fuel Professional

Use Descriptor

Sector(s) of Use

Process Categories 1, 2, 3, 8a, 8b, 16

Environmental Release Categories 9a, 9b

Specific Environmental Release Category ESVOC SpERC 9.12b.v1

Processes, tasks, activities covered

Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Assessment Method

See Section 3.

Section 2 Operational conditions and risk management measures

Section 2.1 Control of worker exposure
Product characteristics

Physical form of product Liquid

Vapour pressure (kPa)	Liquid, vapour pressure 0.5 - 10 kPa at STP. OC4.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1

Contributing Scenarios Specific Risk Management Measures and Operating Conditions

General measures (skin irritants) G19.	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 skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems) GEST_12I Use as a fuel, CS107 (closed systems)	No other specific measures identified. EI20 No other specific measures identified. EI20
CS14 Bulk transfers	No other specific measures identified. EI20
CS22 Transfer from/pouring from containers	No other specific measures identified. EI20
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20
CS85 Bulk Product Storage	No other specific measures identified. EI20

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.6E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	2.3E+3
Maximum daily site tonnage (kg/day)	6.4E+3
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional use only) [OOC7]	1.0E-4
Release fraction to wastewater wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional use only) [OOC9]	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater [TCR1a] If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%)	27.5
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95.0
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	9.2E+4
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2]. External treatment and disposal of waste should	

comply with applicable local and/or national regulations.[ETW3]
Conditions and measures related to external recovery of waste
This substance is consumed during use and no waste of the substance is generated. [ERW3]
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. 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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

9.23.2 Exposure Estimation

9.23.2.1 Human Health

See Appendix 2.a and 2.b.

9.23.2.2 Environment

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

9.24 Use as a Fuel– Consumer

9.24.1 Exposure Scenario

Section 1 Exposure Scenario - Use as a Fuel Consumer Title

Use as a Fuel Consumer

Use Descriptor

Sector(s) of Use

Product Categories 13

Environmental Release Categories 9a, 9b

Specific Environmental Release Category ESVOC SpERC 9.12c.v1

Processes, tasks, activities covered

Covers consumer uses in fuels

Assessment Method

See Section 3.

Section 2 Operational conditions and risk management measures

Section 2.1 Control of consumer exposure

Product characteristics

Physical form of product liquid

Vapour pressure	Liquid, vapour pressure > 10Pa (STP) [OC15]
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used	Unless otherwise stated, covers use amounts up to50000g [ConsOC2]; covers skin contact area up to 420cm2 [ConsOC5]
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 0.143 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC14] Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m^3 room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
Other Operational Conditions affecting exposure	

Product Category Specific Risk Management Measures and

Operating C o n d i t i o n s

PC13:Fuels-- OC [ConsOC1]; Liquid -: Automotive Refuelling	Unless otherwise stated, covers concentrations up to 100% covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 50000g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 0.05hr/event[ConsOC14];
RMM	No specific RMMs developed beyond those OCs stated
PC13:Fuels-- OC [ConsOC1]; Liquid - home heating fuel	Unless otherwise stated, covers concentrations up to 100% covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 1500g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
RMM	No specific RMMs developed beyond those OCs stated
PC13:Fuels-- OC [ConsOC1];	Unless otherwise stated, covers concentrations up to 100%

Liquid - Garden Equipment - Use		covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 1000g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid : Garden Equipment - Refuelling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 420.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 1000g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated

Section 2.2 Control of environmental exposure

Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.5E+5
Fraction of Regional tonnage used locally	0.0005
Annual site tonnage (tonnes/year)	2.3E+2
Maximum daily site tonnage (kg/day)	6.2E+2
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional use only) [OOC7]	1.0E-4
Release fraction to wastewater wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional use only) [OOC9]	0.00001
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95.0
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d)	9.7E+3
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2]. External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated. [ERW3]	

Section 3 Exposure Estimation
3.1. 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 sources, then they are indicated.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. G39. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
4.2. 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 [DSU1]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

9.24.2 Exposure Estimation

9.24.2.1 Human Health

See Appendix 2.c.

9.24.2.2 Environment

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