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

1.1. Product identifier

Product form : Substance
Trade name/designation : FUEL OIL
EC Index : 649-330-00-2
EC-No. : 271-384-7
CAS-No. : 68553-00-4
REACH registration No. : 01-2119489962-20-0010

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

1.2.1. Relevant identified uses

Main use category : Industrial use,Professional use
Use of the substance/mixture : Fuels
Further information: see exposure scenarios attached to this safety data sheet.

Title	Use descriptors
Use as an intermediate (ES Ref.: 02)	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC6a, ESVOC SPERC 6.1a.v1
Distribution (ES Ref.: 03)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Use as a fuel (ES Ref.: 07)	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC7, ESVOC SPERC 7.12a.v1
Use as a fuel (ES Ref.: 08)	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 04)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC2, ESVOC SPERC 2.2.v1

Full text of use descriptors: see section 16

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier
NIS a.d. Novi Sad
Narodnog Fronta 12
21000 Novi Sad
Serbia
T + 381 (0) 21 481 1111
REACHNIS@nis.rs

Only Representative
BENS Consulting d.o.o.
Špruha 19
1236 Trzin
Slovenija
T +386 41 979 800
info@bens-consulting.eu

1.4. Emergency telephone number

Emergency number : + 381 (0) 21 481 1111
Only available during office hours.

Country/Area	Organisation/Company	Address	Emergency number	Comment
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)	

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Acute toxicity (inhal.), Category 4	H332
Carcinogenicity, Category 1B	H350
Reproductive toxicity, Category 2	H361d
Specific target organ toxicity – Repeated exposure, Category 2	H373
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment – Acute Hazard, Category 1	H400
Hazardous to the aquatic environment – Chronic Hazard, Category 1	H410

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS07 GHS08 GHS09

Signal word : Danger

Hazard statements (CLP) : H304 - May be fatal if swallowed and enters airways.
H332 - Harmful if inhaled.
H350 - May cause cancer.
H361d - Suspected of damaging the unborn child.
H373 - May cause damage to organs through prolonged or repeated exposure.
H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements (CLP) : P201 - Obtain special instructions before use.
P260 - Do not breathe vapours.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
P301+P310+P331 - IF SWALLOWED: Immediately call a doctor, a POISON CENTER. Do NOT induce vomiting.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P391 - Collect spillage.
P501 - Dispose of contents and container to an approved waste disposal

plant.

Extra phrases : EUH066 - Repeated exposure may cause skin dryness or cracking. Restricted to professional users.

Listed on CLP Annex VI : EC Index-No.: 649-330-00-2

2.3. Other hazards

Other hazards : Results of PBT and vPvB assessment : This substance does not meet the PBT/vPvB criteria of REACH, annex XIII. as appropriate : Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name : FUEL OIL

CAS-No. : 68553-00-4

EC-No. : 271-384-7

EC Index : 649-330-00-2

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Fuel oil, no. -6	CAS-No.: 68553-00-4 EC-No.: 271-384-7 EC Index: 649-030-00-1 REACH-no: 01-2119489962-20-0010	100	Acute Tox. 4 (Inhalation), H332 (ATE=1,5 mg/l/4h) Carc. 1B, H350 Repr. 2, H361d STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H- and EUH-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

Additional advice : First aider: Pay attention to self-protection!. Concerning personal protective equipment to use, see section 8. Never give anything by mouth to an unconscious person. In case of doubt or persistent symptoms, consult always a physician. Show this safety data sheet to the doctor in attendance.

Inhalation	:	Remove casualty to fresh air and keep warm and at rest. Give oxygen or artificial respiration if necessary. In case of doubt or persistent symptoms, consult always a physician.
Skin contact	:	Remove contaminated clothing and shoes. Gently wash with plenty of soap and water. In case of doubt or persistent symptoms, consult always a physician.
Eyes contact	:	Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. In case of doubt or persistent symptoms, consult always a physician.
Ingestion	:	Rinse mouth thoroughly with water. Do NOT induce vomiting. Get immediate medical advice/attention.

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

Inhalation	:	Harmful if inhaled. Danger of serious damage to health by prolonged exposure. Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.
Skin contact	:	Harmful: danger of serious damage to health by prolonged exposure in contact with skin. Repeated exposure may cause skin dryness or cracking. The following symptoms may occur: mild skin irritation. Hot product (liquid) can cause thermal burns.
Eyes contact	:	Contact with eyes may cause irritation.
Ingestion	:	May be fatal if swallowed and enters airways. May be harmful if swallowed. The following symptoms may occur: Gastrointestinal disturbance.
Chronic symptoms	:	May cause cancer. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	:	carbon dioxide (CO_2), powder, alcohol-resistant foam, water spray.
Unsuitable extinguishing media	:	Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards	:	Combustible liquids. On heating there is a risk of a build-up of pressure in hermetically sealed containers or tanks. Heating may cause an explosion. Vapours may form explosive mixture with air. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. As appropriate : Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.
Hazardous decomposition products in case of fire	:	Carbon oxides (CO, CO_2). Sulphur oxides. sulphuric acid. Hydrogen sulfide.

5.3. Advice for firefighters

Firefighting instructions	:	Evacuate area. Use water spray or fog for cooling exposed containers. Contain the extinguishing fluids by bunding. Prevent fire fighting water from entering the environment.

Protection during firefighting	:	Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus.
Other information	:	Do not allow run-off from fire-fighting to enter drains or water courses. Dispose of waste in accordance with environmental legislation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel	:	Evacuate unnecessary personnel. Keep upwind. Provide adequate ventilation. Wear recommended personal protective equipment. Concerning personal protective equipment to use, see section 8. Do not breathe vapours. Avoid contact with skin, eyes and clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ensure equipment is adequately earthed. Use explosion-proof equipment. Use only non-sparking tools. As appropriate : Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

6.1.2. For emergency responders

For emergency responders	:	Ensure procedures and training for emergency decontamination and disposal are in place. Concerning personal protective equipment to use, see section 8.

6.2. Environmental precautions

Do not allow to enter into surface water or drains. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up	:	Stop leak if safe to do so. Dam up the liquid spill. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. Recover large spills by pumping (use an explosion proof or hand pump). Place in a suitable container for disposal in accordance with the waste regulations (see Section 13). This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

Concerning personal protective equipment to use, see section 8. Concerning disposal elimination after cleaning, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Do not breathe vapours. Avoid contact with skin, eyes and clothing. Take any precaution to avoid mixing with Incompatible materials, Refer to Section 10 on Incompatible Materials. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Avoid release to the environment. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use explosion-proof equipment. Use only non-sparking tools.

Hygiene measures : Keep good industrial hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feedingstuffs. Remove contaminated clothes. Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container tightly closed. Store in a dry, cool and well-ventilated place. Do not store near or with any of the incompatible materials listed in section 10. Bund storage facilities to prevent soil and water pollution in the event of spillage. Take precautionary measures against static discharge.

Incompatible materials : Strong acids. Oxidising agents. Bases.

Heat and ignition sources : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect from sunlight.

Special rules on packaging : Containers which are opened should be properly resealed and kept upright to prevent leakage. Do not pierce or burn, even after use. Keep in properly labelled containers.

Packaging materials : Keep only in the original container. Suitable material: Mild steel, Stainless steel. Unsuitable material: Synthetic material.

Germany

German storage class (LGK) : LGK 6.1C - Combustible substances of acute toxicity, category 3 / hazardous substances that are toxic or produce chronic effects

Switzerland

Storage class (LK) : LK 6.1 - Toxic materials

7.3. Specific end use(s)

see attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

No additional information available

8.1.2. Recommended monitoring procedures

Monitoring methods	
Monitoring methods	Personal air monitoring. Room air monitoring.

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

FUEL OIL (68553-00-4)	
DNEL/DMEL (workers)	
Acute - systemic effects, inhalation	4700 mg/m³
Long-term - systemic effects, dermal	0,065 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	0,12 mg/m³
DNEL/DMEL (general population)	
Long-term - systemic effects,oral	0,015 mg/kg bodyweight/day
PNEC (Oral)	
PNEC oral (secondary poisoning)	66,7 kg/kg

Additional information : Recommended monitoring procedures :. Personal air monitoring. Room air monitoring

8.1.5. Control banding

No additional information available

8.2. Exposure controls

Engineering measure(s) : Use product only in closed system. Use only in area provided with appropriate exhaust ventilation. Provide adequate ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Organisational measures to prevent/limit releases, dispersion and exposure. See Section 7 for information on safe handling. Take precautionary measures against static discharges. Ensure equipment is adequately earthed.

Personal protective equipment : The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hand protection	:	Wear chemically resistant gloves (tested to EN374) . Suitable material: NBR (Nitrile rubber). Breakthrough time : refer to the recommendations of the supplier. Thickness of the glove material: Not determined. The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves.
Eye protection	:	Use suitable eye protection (EN166): Safety glasses
Body protection	:	Wear suitable coveralls to prevent exposure to the skin
Respiratory protection	:	In case of insufficient ventilation, wear suitable respiratory equipment. Half-face mask (DIN EN 140). full face mask (DIN EN 136). Filter type: A (EN 14387). Self-contained open-circuit compressed air breathing apparatus (EN 137). The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, self-contained breathing apparatus must be used. (EN 137)
Thermal hazard protection	:	Not required for normal conditions of use. Use dedicated equipment.
Environmental exposure controls	:	Avoid release to the environment. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	Black.
Appearance	:	Liquid.
Odour	:	Characteristic.
Odour threshold	:	No data available
Melting / freezing point	:	No data available
Freezing point	:	Not available
Initial boiling point and boiling range	:	200 – 650 °C
Flammability	:	Combustible
Explosive properties	:	Not applicable. The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	:	Not applicable. The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.
Lower explosion limit	:	Not available
Upper explosion limit	:	Not available
Flash point	:	> 80 °C
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
pH	:	Not applicable
Kinematic viscosity	:	22,47 mm^2/s (100°C) ; 199,94 mm^2/s (50°C)
Dynamic viscosity	:	No data available
Solubility	:	Water: Partially soluble

Partition coefficient n-octanol/water (Log Kow)	:	No data available
Vapour pressure	:	< 0,7 kPa (20°C)
Vapour pressure at 50°C	:	Not available
Density	:	Not available
Relative density	:	0,94 – 0,99 g/cm³ (15°C)
Vapour density	:	> 5 (Air=1)
Particle characteristics	:	Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosion limits	:	0,6 – 6,5 vol %

9.2.2. Other safety characteristics

VOC content	:	No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Combustible. Reference to other sections: 10.4 & 10.5.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

None under normal processing. No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Avoid the build-up of electrostatic charge. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect from sunlight. See Section 7 for information on safe handling.

10.5. Incompatible materials

Incompatible with strong acids and oxidizing agents. Bases . See Section 7 for information on safe handling.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO2). Sulphur oxides. Sulphuric acid. Hydrogen sulfide. Reference to other sections 5.2.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Harmful if inhaled.

FUEL OIL (68553-00-4)	
LD50/oral/rat	> 2000 mg/kg

FUEL OIL (68553-00-4)	
LD50/dermal/rabbit	> 2000 mg/kg
LC50/inhalation/4h/rat	4100 – 4500 mg/m³

Fuel oil, no. -6 (68553-00-4)	
LD50/oral/rat	5300 mg/kg (Source: NLM_CIP)
LD50/dermal/rabbit	> 4874 mg/kg (Source: CHEMVIEW)

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)
pH: Not applicable

Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met)
pH: Not applicable

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)

Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)

Carcinogenicity : May cause cancer.

Reproductive toxicity : Suspected of damaging the unborn child.

Additional information : NOAEL = 125 - 2000 mg/kg BW/d

STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)

STOT-repeated exposure : May cause damage to organs through prolonged or repeated exposure.

Additional information : NOAEL = > 1 mg/kg BW/d

Fuel oil, no. -6 (68553-00-4)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : May be fatal if swallowed and enters airways.

FUEL OIL (68553-00-4)	
Kinematic viscosity	22,47 mm²/s (100°C) ; 199,94 mm²/s (50°C)

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

11.2.2. Other information

Other information : Symptoms related to the physical, chemical and toxicological characteristics,For further information see section 4

SECTION 12: Ecological information

12.1. Toxicity

Environmental properties : Very toxic to aquatic life with long lasting effects.

Hazardous to the aquatic environment, short–term (acute) : Very toxic to aquatic life.

Hazardous to the aquatic environment, long–term (chronic) : Very toxic to aquatic life with long lasting effects.

FUEL OIL (68553-00-4)	
Acute aquatic toxicity, Invertebrates	EL50 = 2 mg/l
Acute (short-term) algae toxicity, ErL50 = 0,75 mg/l	
Acute (short-term) fish toxicity, LL50	79 mg/l
Chronic (long-term) fish toxicity, NOEL	0.1 mg/l
Long term effects, Invertebrates, NOEL	0,75 mg/l
Bird reproduction toxicity, NOAEL	20000 mg/l

Fuel oil, no. -6 (68553-00-4)	
LC50 - Fish [1]	48 mg/l (96h)

12.2. Persistence and degradability

FUEL OIL (68553-00-4)	
Persistence and degradability	Not applicable. Substance is complex UVCB.

12.3. Bioaccumulative potential

FUEL OIL (68553-00-4)	
Partition coefficient n-octanol/water (Log Kow)	No data available
Bioaccumulative potential	Not applicable. Substance is complex UVCB.

12.4. Mobility in soil

FUEL OIL (68553-00-4)	
Mobility in soil	No data available
Ecology - soil	No data available.

12.5. Results of PBT and vPvB assessment

FUEL OIL (68553-00-4)	
Results of PBT assessment	This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

12.7. Other adverse effects

Other adverse effects : No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

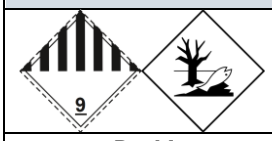
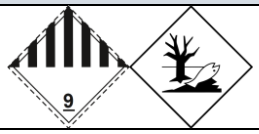
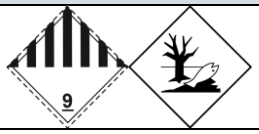
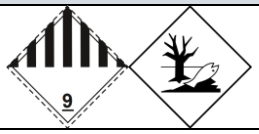
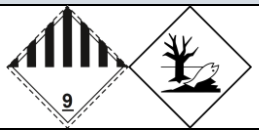
Product/Packaging disposal recommendations : Avoid release to the environment. Dispose of empty containers and wastes safely. See Section 7 for information on safe handling. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration. If recycling is not possible, eliminate in accordance with local valid waste disposal regulations. Handle contaminated packages in the same way as the substance itself. Dispose of contaminated materials in accordance with current regulations. Packaging contaminated by the product : Do not pierce or burn, even after use. Never use pressure to empty container.

European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC) : This material and its container must be disposed of as hazardous waste
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities
The following Waste Codes are only suggestions:
13 07 01* - fuel oil and diesel
15 01 10* - packaging containing residues of or contaminated by dangerous substances

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
3082	3082	3082	3082	3082
14.2. UN proper shipping name				
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6)	Environmentally hazardous substance, liquid, n.o.s. (CONTAINS : Fuel oil, no. -6)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6)
Transport document description				
UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6), 9, III, (-)	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6), 9, III, MARINE POLLUTANT	UN 3082 Environmentally hazardous substance, liquid, n.o.s. (CONTAINS : Fuel oil, no. -6), 9, III	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6), 9, III	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS : Fuel oil, no. -6), 9, III
14.3. Transport hazard class(es)				
9	9	9	9	9

ADR	IMDG	IATA	ADN	RID
				
14.4. Packing group				
III	III	III	III	III
14.5. Environmental hazards				
Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes
No supplementary information available				

14.6. Special precautions for user

Special precautions for user : No data available

- Overland transport

Classification code (ADR)	:	M6
Special provisions	:	274, 335, 375, 601, 650
Limited quantities (ADR)	:	5l
Excepted quantities (ADR)	:	E1
Packing instructions (ADR)	:	P001, IBC03, LP01, R001
Special packing provisions (ADR)	:	PP1
Mixed packing provisions (ADR)	:	MP19
Portable tank and bulk container instructions (ADR)	:	T4
Portable tank and bulk container special provisions (ADR)	:	TP1, TP29
Tank code (ADR)	:	LGBV
Vehicle for tank carriage	:	AT
Transport category (ADR)	:	3
Special provisions for carriage - Packages (ADR)	:	V12
Special provisions for carriage - Loading, unloading and handling (ADR)	:	CV13
Hazard identification number (Kemler No.)	:	90
Orange plates	:	90 3082
Tunnel restriction code	:	-
EAC code	:	•3Z

- Transport by sea

Special provisions (IMDG)	:	274, 335, 375, 969
Limited quantities (IMDG)	:	5 L
Limited quantities (IMDG)	:	5 L
Excepted quantities (IMDG)	:	E1

Packing instructions (IMDG)	:	LP01, P001
Special packing provisions (IMDG)	:	PP1
IBC packing instructions (IMDG)	:	IBC03
Tank instructions (IMDG)	:	T4
Tank special provisions (IMDG)	:	TP1, TP29
EmS-No. (Fire)	:	F-A
EmS-No. (Spillage)	:	S-F
Stowage category (IMDG)	:	A

- Air transport

PCA Excepted quantities (IATA)	:	E1
PCA Limited quantities (IATA)	:	Y964
PCA limited quantity max net quantity (IATA)	:	30kgG
PCA packing instructions (IATA)	:	964
PCA max net quantity (IATA)	:	450L
CAO packing instructions (IATA)	:	964
CAO max net quantity (IATA)	:	450L
Special provisions (IATA)	:	A97, A158, A197, A215
ERG code (IATA)	:	9L

- Inland waterway transport

Classification code (ADN)	:	M6
Special provisions (ADN)	:	274, 335, 375, 601, 650
Limited quantities (ADN)	:	5 L
Excepted quantities (ADN)	:	E1
Carriage permitted (ADN)	:	T
Equipment required (ADN)	:	PP
Number of blue cones/lights (ADN)	:	0

- Rail transport

Classification code (RID)	:	M6
Special provisions (RID)	:	274, 335, 375, 601, 650
Limited quantities (RID)	:	5L
Excepted quantities (RID)	:	E1
Packing instructions (RID)	:	P001, IBC03, LP01, R001
Special packing provisions (RID)	:	PP1
Mixed packing provisions (RID)	:	MP19
Portable tank and bulk container instructions (RID)	:	T4
Portable tank and bulk container special provisions (RID)	:	TP1, TP29
Tank codes for RID tanks (RID)	:	LGBV
Transport category (RID)	:	3
Special provisions for carriage – Packages (RID)	:	W12
Special provisions for carriage - Loading, unloading and handling (RID)	:	CW13, CW31

Colis express (express parcels) (RID) : CE8
Hazard identification number (RID) : 90

14.7. Maritime transport in bulk according to IMO instruments

Code: IBC : No data available.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)		
Reference code	**Applicable on**	**Entry title or description**
28.	FUEL OIL ; Fuel oil, no. -6	Substances which are classified as carcinogen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 1 or Appendix 2, respectively.
3(b)	FUEL OIL ; Fuel oil, no. -6	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10
3(c)	FUEL OIL ; Fuel oil, no. -6	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1

REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

Ozone Regulation (2024/590)

Not listed on the Ozone Depletion list (Regulation EU 2024/590)

Council Regulation (EC) for the control of dual-use items

Contains no substance subject to the COUNCIL REGULATION (EC) for the control of dual-use items

VOC Directive (2004/42)

VOC content :No data available

Explosives Precursors Regulation (EU 2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (EC 273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

Detergent Regulation (648/2004/EC): Labelling of contents

Labelling for contents according to regulation (EC) No. 648/2004 : Not applicable

15.1.2. National regulations

France

Installations classées			
No ICPE	Désignation de la rubrique	Code Régime	Rayon
4734.text	Produits pétroliers spécifiques et carburants de substitution : essences et naphtas ; kérosènes (carburants d'aviation compris) ; gazoles (gazole diesel, gazole de chauffage domestique et mélanges de gazoles compris) ; fioul lourd ; carburants de substitution pour véhicules, utilisés aux mêmes fins et aux mêmes usages et présentant des propriétés similaires en matière d'inflammabilité et de danger pour l'environnement. La quantité totale susceptible d'être présente dans les installations y compris dans les cavités souterraines étant :		
4734.1a	1. Pour les cavités souterraines et les stockages enterrés : a) Supérieure ou égale à 2 500 t Quantité seuil bas au sens de l'article R. 511-10 : 2 500 t. Quantité seuil haut au sens de l'article R. 511-10 : 25 000 t.	A	
4734.1b	1. Pour les cavités souterraines et les stockages enterrés : b) Supérieure ou égale à 1 000 t mais inférieure à 2 500 t Quantité seuil bas au sens de l'article R. 511-10 : 2 500 t. Quantité seuil haut au sens de l'article R. 511-10 : 25 000 t.	E	2
4734.1c	1. Pour les cavités souterraines et les stockages enterrés : c) Supérieure ou égale à 50 t d'essence ou 250 t au total, mais inférieure à 1 000 t au total Quantité seuil bas au sens de l'article R. 511-10 : 2 500 t. Quantité seuil haut au sens de l'article R. 511-10 : 25 000 t.	DC	2
4734.2a	2. Pour les autres stockages : a) Supérieure ou égale à 1 000 t Quantité seuil bas au sens de l'article R. 511-10 : 2 500 t. Quantité seuil haut au sens de l'article R. 511-10 : 25 000 t.	A	2
4734.2b	2. Pour les autres stockages : b) Supérieure ou égale à 100 t d'essence ou 500 t au total, mais inférieure à 1 000 t au total Quantité seuil bas au sens de l'article R. 511-10 : 2 500 t. Quantité seuil haut au sens de l'article R. 511-10 : 25 000 t.	E	2
4734.2c	2. Pour les autres stockages : c) Supérieure ou égale à 50 t au total, mais inférieure à 100 t d'essence et inférieure à 500 t au total Quantité seuil bas au sens de l'article R. 511-10 : 2 500 t. Quantité seuil haut au sens de l'article R. 511-10 : 25 000 t.	DC	2

Germany

Water hazard class (WGK) : WGK 3, Highly hazardous to water (Classification according to AwSV; ID No. 443).

Chemicals Prohibition Ordinance (ChemVerbotsV) : This product is subject to ChemVerbotsV Annex 2 Entry 1. The following requirements must be observed: authorization requirement (according to § 6 paragraph 1 sentence 1), basic requirements for carrying out the delivery (according to § 8 paragraph 1, 3 and 4), identification and documentation (according to § 9 paragraph 1 to 3) and exclusion of the shipping route (according to § 10).

Major Accidents Ordinance (12. BImSchV) : Listed in the 12. BImSchV (Annex I) under: 2.3.4
- Quantity threshold for operational area under § 1 para. 1
  - Sentence 1 :2500000 kg
  - Sentence 2 :25000000 kg

Netherlands

Waterbezwaarlijkheid : categorie Z(1) - niet-afbreekbare stoffen met gevaarlijke eigenschappen voor mens en milieu (carcinogeniteit/ mutageniteit/ reprotoxiciteit/ bioacumulerend vermogen/ toxiciteit of persistentie)
SZW-lijst van kankerverwekkende stoffen : FUEL OIL is listed
SZW-lijst van mutagene stoffen : The substance is not listed
SZW-lijst van reprotoxische stoffen – Borstvoeding : The substance is not listed
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid : The substance is not listed
SZW-lijst van reprotoxische stoffen – Ontwikkeling : The substance is not listed

Denmark

Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations : Young people below the age of 18 years are not allowed to use the product
Pregnant/breastfeeding women working with the product must not be in direct contact with the product
The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:

1.3	Details of the supplier of the safety data sheet	Modified	
2.2	Precautionary statements (CLP)	Update	
16	Other information	Added	

Abbreviations and acronyms:

	DNEL = Derived No Effect Level
	DMEL = Derived Minimal Effect level
	PNEC = Predicted No Effect Concentration
	OEL-STEL = Occupational Exposure Limits - Short Term Exposure Limits (STELs)
	TWA = time weighted average
	LC50 = Median lethal concentration
	LD50 = Median lethal dose
	LL50 = Median lethal level
	EC50 = Median Effective Concentration
	EL50 = Median effective level
	ErC50 = EC50 in terms of reduction of growth rate
	ErL50 = EL50 in terms of reduction of growth rate
	NOEL = no-observed-effect level
	NOEC = No observed effect concentration
	NOELR = No observed effect loading rate
	NOAEC = No observed adverse effect concentration

	NOAEL = No observed adverse effect level
	EWC = European waste catalogue
	NA = Not applicable
	N.O.S. = Not Otherwise Specified
	VOC = Volatile organic compounds
	mg/kg BW = mg/kg bodyweight
	QSAR = Quantitative structure-activity relationship (QSAR)
	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
	ABM = Algemene beoordelingsmethodiek

Sources of key data used to compile the datasheet : ECHA (European Chemicals Agency). CSR = Chemical Safety Report. CONCAWE.

Training advice : Training staff on good practice. Manipulations are to be done only by qualified and authorised persons.

Other information : Hazard classification and labeling of petroleum substances in the European Economic Area, Concawe – 2025 (http://www.concawe.eu).

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 1B	Carcinogenicity, Category 1B
Repr. 2	Reproductive toxicity, Category 2
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
H304	May be fatal if swallowed and enters airways.
H332	Harmful if inhaled.
H350	May cause cancer.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
	Restricted to professional users
EUH066	Repeated exposure may cause skin dryness or cracking.

Full text of use descriptors

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate

ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC15	Use as laboratory reagent
PROC16	Use of fuels
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC28	Manual maintenance (cleaning and repair) of machinery
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU9	Manufacture of fine chemicals

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

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Annex to the safety data sheet

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Use as an intermediate	SU8, SU9		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28		ERC6a	ESVOC SPERC 6.1a.v1
Distribution			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Formulation & (re)packing of substances and mixtures			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28		ERC2	ESVOC SPERC 2.2.v1
Use as a fuel			PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28		ERC7	ESVOC SPERC 7.12a.v1
Use as a fuel			PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28		ERC9a, ERC9b	ESVOC SPERC 9.12b.v1

1. Exposure scenario 02

Use as an intermediate

ES Ref.: 02 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 SU8, SU9 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks activities covered	Use as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). 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). Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form	Liquid, vapour pressure < 0,5 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature),Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	
General exposures (closed systems) (PROC_1)	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
General exposures (closed systems) (PROC_2)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations	

	according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
General exposures,Batch process,Closed systems	Covers use up to 4.0 h/day,Provide extract ventilation to points where emissions occur,Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes,Put lids on containers immediately after use.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,Ensure complete segregation with ventilation and filtration of recirculated air,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Wear a full face respirator conforming to EN136,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Remotely vent displaced vapours,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Use vapour recovery units when necessary,E52 - Transfer via enclosed lines,Clear	

	transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 80.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Provide extract ventilation to material transfer points and other openings,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 80.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Ensure complete segregation with ventilation and filtration of recirculated air,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 80.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
CS39 - Equipment cleaning and maintenance	Avoid carrying out operation for more than 4 hours,Drain down and flush system prior to equipment break-in or maintenance,Wear a respirator conforming to EN140,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands,For further specification, refer to section 8 of the SDS,Covers use at ambient temperatures,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Clear spills immediately	
CS85 - Bulk product storage (PROC_1)	E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS85 - Bulk product storage (PROC_2)	Provide extract ventilation to points where emissions occur,E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations	

	according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	

2.2 Contributing scenario controlling environmental exposure (ERC6a, ESVOC SPERC 6.1a.v1)

ERC6a	Use of intermediate
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1800000
	Fraction of regional tonnage used locally:	0,0082
	Annual site tonnage (tons/year):	15000
	Maximum daily site tonnage (kg/day)	50000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,001
	Release fraction to wastewater from process (initial release prior to RMM):	0,00003
	Release fraction to soil from process (initial release prior to RMM):	0,001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required,Prevent discharge of undissolved substance to or recover from onsite wastewater.	
	Treat air emission to provide a typical removal efficiency of (%):	80
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	75,3
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,2
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,2
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	76000
	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.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

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

4.2. Environment

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

1. Exposure scenario 03

Distribution

ES Ref.: 03 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1
Processes, tasks activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

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

Product characteristics

Physical form	Liquid, vapour pressure < 0,5 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature,Unless otherwise stated,Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	
CS2 - Process sampling,outdoor	Sample via a closed loop or other system to avoid	

	exposure,Avoid carrying out activities involving exposure for more than 15 minutes,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
General exposures (closed systems)	E47 - Handle substance within a closed system,Avoid carrying out activities involving exposure for more than 4 hours,Sample via a closed loop or other system to avoid exposure,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
CS85 - Bulk product storage	E84 - Store substance within a closed system,Avoid carrying out activities involving exposure for more than 4 hours,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Product sampling	Sample via a closed loop or other system to avoid exposure,Avoid carrying out activities involving exposure for more than 15 minutes,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure,PPE15 - Wear suitable gloves tested to EN374.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Retain drain downs in sealed storage pending disposal or for subsequent recycle,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Road tanker/rail car	Ensure material transfers are under containment or extract ventilation,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Retain drain downs in sealed storage pending disposal or for subsequent recycle.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	470000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	940
	Maximum daily site tonnage (kg/day)	47000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	20

Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,001
	Release fraction to wastewater from process (initial release prior to RMM):	0,00000088
	Release fraction to soil from process (initial release prior to RMM):	0,00001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Indirect exposure to humans via the environment:No wastewater treatment required.	
	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 of ≥ (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	91,6
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	91,6
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	350000
	Assumed domestic sewage treatment plant flow (m³/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.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

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

4.2. Environment

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

	removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 04

Formulation & (re)packing of substances and mixtures

ES Ref.: 04 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks activities covered	Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form	Liquid, vapour pressure < 0,5 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature,Unless otherwise stated,Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the	

	need for risk based health surveillance.	
General exposures (closed systems) (PROC_1)	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
General exposures (closed systems) (PROC_2)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
General exposures,Batch process,Closed systems	Covers use up to 4.0 h/day,Provide extract ventilation to points where emissions occur,Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes,Put lids on containers immediately after use.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,Ensure complete segregation with ventilation and filtration of recirculated air,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Marine vessel/barge	Avoid carrying out activities involving exposure for more than 4 hours,E52 - Transfer via enclosed lines,E39 - Clear transfer lines prior to de-coupling,Wear a full face respirator conforming to EN136,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Remotely vent displaced vapours,E52 - Transfer via enclosed lines,Clear transfer lines prior	

	to de-coupling,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Use vapour recovery units when necessary,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 80.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Provide extract ventilation to material transfer points and other openings,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 80.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Road tanker/rail car	Avoid carrying out operation for more than 2 hours,Ensure complete segregation with ventilation and filtration of recirculated air,E52 - Transfer via enclosed lines,Clear transfer lines prior to de-coupling,Ensure operation is undertaken outdoors,Assumes process temperature up to 80.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
CS39 - Equipment cleaning and maintenance	Avoid carrying out operation for more than 4 hours,Drain down and flush system prior to equipment break-in or maintenance,Wear a respirator conforming to EN140,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands,For further specification, refer to section 8 of the SDS,Covers use at ambient temperatures,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable	

	coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Clear spills immediately	
CS85 - Bulk product storage (PROC_1)	E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS85 - Bulk product storage (PROC_2)	Provide extract ventilation to points where emissions occur,E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	

2.2 Contributing scenario controlling environmental exposure (ERC2, ESVOC SPERC 2.2.v1)

ERC2	Formulation into mixture
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	7500000
	Fraction of regional tonnage used locally:	0,004
	Annual site tonnage (tons/year):	30000
	Maximum daily site tonnage (kg/day)	100000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements):	0,0025
	Release fraction to wastewater from process (initial release prior to RMM):	0,00002
	Release fraction to soil from process (initial release prior to RMM):	0,0001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Indirect exposure to humans via the environment:If discharging to domestic sewage treatment plant, no onsite wastewater treatment required,Prevent discharge of undissolved substance to or recover from onsite wastewater.	
	Treat air emission to provide a typical removal efficiency of (%):	0
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	81,4
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,2
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,2
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	110000

	(kg/d):	
	Assumed domestic sewage treatment plant flow (m³/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.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

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

4.2. Environment

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

1. Exposure scenario 07

Use as a fuel

ES Ref.: 07 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28 ERC7 ESVOC SPERC 7.12a.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. Use at industrial sites (IS)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form	Liquid, vapour pressure < 0,5 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature,Unless otherwise stated,Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	

General exposures (closed systems) (PROC_1)	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
General exposures (closed systems) (PROC_2)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
Bulk closed unloading,outdoor	Avoid carrying out activities involving exposure for more than 4 hours,Ensure material transfers are under containment or extract ventilation,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS8 - Drum/batch transfers,Dedicated facility	Avoid carrying out activities involving exposure for more than 1 hour,Ensure material transfers are under containment or extract ventilation,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Use as a fuel,CS107 - (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour),Handle substance within a closed system,Assumes process temperature up to 90.0 °C,Operate activity away from sources of substance emission or release,Assumes large workrooms,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS117 - Operation of solids filtering equipment	Avoid carrying out activities involving exposure for more than 4 hours,Provide a good standard of controlled ventilation (5 to 10 air changes per hour),Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS39 - Equipment cleaning and maintenance	Avoid carrying out operation for more than 4 hours,Drain down and flush system prior to equipment break-in or maintenance,Wear a respirator conforming to EN140,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands,For further specification, refer to section 8 of the SDS,Covers use at ambient temperatures,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Clear spills immediately	
CS85 - Bulk product storage (PROC_1)	E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS85 - Bulk product storage (PROC_2)	Avoid carrying out operation for more than 1	

	hour,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour),E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	

2.2 Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.12a.v1)

ERC7	Use of functional fluid at industrial site
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5900000
	Fraction of regional tonnage used locally:	0,25
	Annual site tonnage (tons/year):	1500000
	Maximum daily site tonnage (kg/day)	5000000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,0009
	Release fraction to wastewater from process (initial release prior to RMM):	0,0000012
	Release fraction to soil from process (initial release prior to RMM):	0

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	95
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	93,5
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,2
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,2
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	5600000
	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,Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

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

4.2. Environment

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

1. Exposure scenario 08

Use as a fuel

ES Ref.: 08 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. Widespread use by professional workers (PW)
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form	Liquid, vapour pressure < 0,5 kPa at STP.
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature,Unless otherwise stated,Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.	

General exposures (closed systems) (PROC_1)	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
General exposures (closed systems) (PROC_2)	Avoid carrying out operation for more than 4 hours,Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour),E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,Wear a respirator conforming to EN140,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
Bulk closed unloading,outdoor	Avoid carrying out activities involving exposure for more than 4 hours,Ensure material transfers are under containment or extract ventilation,Wear a respirator conforming to EN140,Ensure operation is undertaken outdoors,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS8 - Drum/batch transfers,Dedicated facility	Avoid carrying out activities involving exposure for more than 1 hour,Ensure material transfers are under containment or extract ventilation,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
refuelling	Avoid carrying out operation for more than 1 hour,Ensure material transfers are under containment or extract ventilation,Ensure operation is undertaken outdoors,Assumes process temperature up to 60.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes,Ensure no splashing occurs during transfer.	
Use as a fuel,CS107 - (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour),Handle substance within a closed system,Assumes process temperature up to 90.0 °C,Operate activity away from sources of substance emission or release,Assumes large workrooms,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS39 - Equipment cleaning and maintenance	Avoid carrying out operation for more than 1 hour,Drain down and flush system prior to equipment break-in or maintenance,Wear a respirator conforming to EN140,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands,For further specification, refer to section 8 of the SDS,Covers use at ambient temperatures,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Provide employee with skin care programmes,Clear spills immediately	
CS85 - Bulk product storage (PROC_1)	E84 - Store substance within a closed	

	system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	
CS85 - Bulk product storage (PROC_2)	Avoid carrying out operation for more than 1 hour,Provide extract ventilation to points where emissions occur,E84 - Store substance within a closed system,Assumes process temperature up to 90.0 °C,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Provide employee with skin care programmes.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.12b.v1)

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1600000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	800
	Maximum daily site tonnage (kg/day)	2200
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Indirect exposure to humans via the environment:No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	90
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,2
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,2
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	3700
	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,Combustion emissions considered in regional exposure assessment.	

Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

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

4.2. Environment

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