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

1.1. Product identifier

Product form : Substance
Trade name/designation : HEATING OIL
EC Index : 649-227-00-2
EC-No. : 270-676-1
CAS-No. : 68476-34-6
REACH registration No. : 01-2119475502-40-0018
Product group : Trade product

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
Distribution of substance (ES Ref.: 01a)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Use as an intermediate (ES Ref.: 01b)	SU8, SU9, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15, PROC28, ERC6a, ESVOC SPERC 6.1a.v1
Use as a fuel (ES Ref.: 12a)	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC7, ESVOC SPERC 7.12a.v1
Use as a fuel (ES Ref.: 12b)	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Use as a fuel (ES Ref.: 12c)	PC13, ERC9a, ERC9b, ESVOC SPERC 9.12c.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 02)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, 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]

Flammable liquids, Category 3	H226
Carcinogenicity, Category 2	H351
Hazardous to the aquatic environment – Chronic Hazard, Category 2	H411
Skin corrosion/irritation, Category 2	H315
Acute toxicity (inhal.), Category 4	H332
Specific target organ toxicity – Repeated exposure, Category 2	H373
Aspiration hazard, Category 1	H304

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) :

GHS02 GHS08 GHS07 GHS09

Signal word : Danger

Hazard statements (CLP) :
H226 - Flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H332 - Harmful if inhaled.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP) :
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
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.
P391 - Collect spillage.
P403+P235 - Store in a well-ventilated place. Keep cool.

P501 - Dispose of contents and container to an approved waste disposal plant.

Listed on CLP Annex VI : EC Index-No.: 649-227-00-2

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. Vapours can form explosive mixtures with air. 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 : HEATING OIL
CAS-No. : 68476-34-6
EC-No. : 270-676-1
EC Index : 649-227-00-2

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Fuels, diesel, no. -2	CAS-No.: 68476-34-6 EC-No.: 270-676-1 EC Index: 649-227-00-2 REACH-no: 01-2119475502-40-0018	≤ 100	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation), H332 (ATE=1,5 mg/l/4h) Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

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. 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. 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. May cause respiratory irritation. The following symptoms may occur: Headache. Nausea. Dizziness. Inhalation of high vapour concentrations can cause CNS-depression and narcosis.
Skin contact	:	Causes skin irritation. The following symptoms may occur: Redness, pain.
Eyes contact	:	Contact with eyes may cause irritation.
Ingestion	:	May be fatal if swallowed and enters airways. Harmful: may cause lung damage if swallowed.
Chronic symptoms	:	Suspected of causing cancer. 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 (CO2), powder, alcohol-resistant foam, water spray.
Unsuitable extinguishing media	:	Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards	:	Flammable liquid and vapour. Heating will cause a rise in pressure with a risk of bursting. 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, CO2). Sulphur oxides. Hydrogen sulfide. sulphuric acid.

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. Cover the spilled liquid product with foam to slow down evaporation. After cleaning, flush traces away with water.

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 : Storage of flammable liquids. 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 3 - Flammable liquids

Switzerland

Storage class (LK) : LK 3 - Flammable liquids

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

Fuels, diesel, no. -2 (68476-34-6)	
Belgium - Occupational Exposure Limits	
OEL TWA	100 mg/m³ (aerosol and vapor)
OEL chemical category	Skin
Portugal - Occupational Exposure Limits	
OEL TWA	100 mg/m³ (inhalable fraction; vapor (Diesel fuel)
OEL chemical category	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans as total hydrocarbons, skin - potential for cutaneous exposure
USA - ACGIH - Occupational Exposure Limits	
ACGIH® TLV® TWA	100 mg/m³ (inhalable fraction and vapor (Diesel fuel)
ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans, Skin - potential significant contribution to overall exposure by the cutaneous route

8.1.2. Recommended monitoring procedures

Monitoring methods	
Monitoring methods	Personal air monitoring. Concentration measurement in air. Personal air monitoring. Room air monitoring.

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

HEATING OIL (68476-34-6)	
DNEL/DMEL (workers)	
Acute - systemic effects, inhalation	(15min) 4300 mg/m³
Long-term - systemic effects, dermal	(8h) 2,9 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	(8h) 68 mg/m³
DNEL/DMEL (general population)	
Acute - systemic effects, inhalation	(15min) 2600 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	20 mg/m³
Long-term - systemic effects, dermal	1,3 mg/kg bodyweight/day

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)	:	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. Use explosion-proof machinery, apparatus, ventilation facilities, tools etc.
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: rubber gloves, NBR (Nitrile rubber). Breakthrough time : >480 minutes. Thickness of the glove material: Not determined. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.
Eye protection	:	Use suitable eye protection (EN166): Safety glasses. goggles
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). 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	:	Comply with applicable Community environmental protection legislation. Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	red.
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	:	156 – 400 °C
Flammability	:	Flammable liquid and vapour.
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	:	> 55 °C Closed cup
Auto-ignition temperature	:	~ > 200 °C
Decomposition temperature	:	No data available
pH	:	Not applicable
Kinematic viscosity	:	≤ 0,87 mm^2/s (20°C)
Dynamic viscosity	:	No data available
Solubility	:	No additional information available.
Partition coefficient n-octanol/water (Log Kow)	:	3,9 – 6
Vapour pressure	:	< 0,1 kPa
Vapour pressure at 50°C	:	Not available
Density	:	~ 0,84 g/cm^3 (15°C)
Relative density	:	0,83 – 0,87 g/cm^3
Vapour density	:	> 3
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

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Flammable liquid and vapour. Reference to other sections: 10.4 & 10.5.

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

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. Hydrogen sulfide. Sulphuric acid. 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.

Fuels, diesel, no. -2 (68476-34-6)	
LD50/oral/rat	> 2000 mg/kg
LD50/dermal/rabbit	> 5000 mg/kg
LC50/inhalation/4h/rat	4,1 mg/l

Skin corrosion/irritation : Causes skin irritation.
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 : Suspected of causing cancer.

Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)

Additional information : Effects on fertility :
NOAEL, Dermal, Rat: 500 mg/kg bodyweight/day
NOAEC, Inhalation, Rat: 1710 mg/m³
Developmental toxicity :
NOAEL, Dermal, Rat: 125 mg/kg bodyweight/day
NOAEC, Inhalation, Rat: 2110 mg/m³

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.

Fuels, diesel, no. -2 (68476-34-6)	
NOAEL (dermal, rat/rabbit, 90 days)	30 mg/kg bodyweight/day
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

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

HEATING OIL (68476-34-6)	
Kinematic viscosity	≤ 0,87 mm²/s (20°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 : Toxic to aquatic life with long lasting effects.

Hazardous to the aquatic environment, short–term (acute) : Not classified

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

Fuels, diesel, no. -2 (68476-34-6)	
LC50 - Fish [1]	65 mg/l (96h)
EC50 - Crustacea [1]	68 mg/l (48h)
ErC50 algae	22 mg/l
NOEL, Fish	0.083 mg/l
NOEL, Invertebrates	0.2 mg/l

12.2. Persistence and degradability

HEATING OIL (68476-34-6)	
Persistence and degradability	Readily biodegradable.

12.3. Bioaccumulative potential

HEATING OIL (68476-34-6)	
Partition coefficient n-octanol/water (Log Kow)	3,9 – 6
Bioaccumulative potential	No additional information available.

Fuels, diesel, no. -2 (68476-34-6)	
Partition coefficient n-octanol/water	> 3

12.4. Mobility in soil

HEATING OIL (68476-34-6)	
Mobility in soil	No data available

HEATING OIL (68476-34-6)	
Ecology - soil	No data available.

12.5. Results of PBT and vPvB assessment

HEATING OIL (68476-34-6)	
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

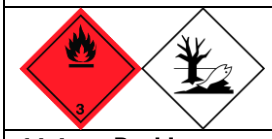
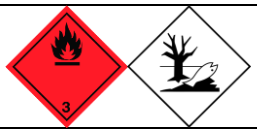
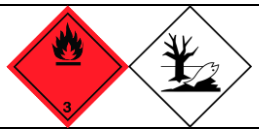
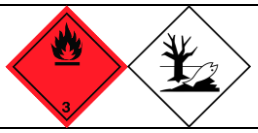
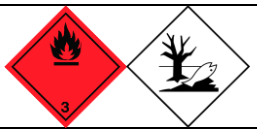
Product/Packaging disposal recommendations : Avoid release to the environment. Dispose of empty containers and wastes safely. See Section 7 for information on safe handling. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration. If recycling 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				
1202	1202	1202	1202	1202
14.2. UN proper shipping name				
GAS OIL / DIESEL FUEL / HEATING OIL, LIGHT	GAS OIL	Gas oil	GAS OIL	GAS OIL
Transport document description				
UN 1202 GAS OIL / DIESEL FUEL / HEATING OIL, LIGHT,	UN 1202 GAS OIL, 3, III, MARINE POLLUTANT/ENVIRO	UN 1202 Gas oil, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 1202 GAS OIL, 3, III, ENVIRONMENTALLY	UN 1202 GAS OIL, 3, III, ENVIRONMENTALLY

ADR	IMDG	IATA	ADN	RID
3, III, (D/E), ENVIRONMENTALLY HAZARDOUS	NMENTALLY HAZARDOUS		HAZARDOUS	HAZARDOUS
14.3. Transport hazard class(es)				
3	3	3	3	3
				
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)	:	F1
Special provisions	:	640K, 363, 664
Limited quantities (ADR)	:	5l
Excepted quantities (ADR)	:	E1
Packing instructions (ADR)	:	P001, IBC03, LP01, R001
Mixed packing provisions (ADR)	:	MP19
Portable tank and bulk container instructions (ADR)	:	T2
Portable tank and bulk container special provisions (ADR)	:	TP1
Tank code (ADR)	:	LGBF
Vehicle for tank carriage	:	FL
Transport category (ADR)	:	3
Special provisions for carriage - Packages (ADR)	:	V12
Special provisions for carriage - Operation (ADR)	:	S2
Hazard identification number (Kemler No.)	:	30
Orange plates	:	30 1202
Tunnel restriction code	:	D/E
EAC code	:	3Y

- Transport by sea

Special provisions (IMDG)	: 363
Limited quantities (IMDG)	: 5 L
Excepted quantities (IMDG)	: E1
Packing instructions (IMDG)	: P001, LP01
IBC packing instructions (IMDG)	: IBC03
Tank instructions (IMDG)	: T2
Tank special provisions (IMDG)	: TP1
EmS-No. (Fire)	: F-E
EmS-No. (Spillage)	: S-E
Stowage category (IMDG)	: A
Properties and observations (IMDG)	: Immiscible with water.

- Air transport

PCA Excepted quantities (IATA)	: E1
PCA Limited quantities (IATA)	: Y344
PCA limited quantity max net quantity (IATA)	: 10L
PCA packing instructions (IATA)	: 355
PCA max net quantity (IATA)	: 60L
CAO packing instructions (IATA)	: 366
CAO max net quantity (IATA)	: 220L
Special provisions (IATA)	: A3
ERG code (IATA)	: 3L

- Inland waterway transport

Classification code (ADN)	: F1
Special provisions (ADN)	: 363, 640K
Limited quantities (ADN)	: 5 L
Excepted quantities (ADN)	: E1
Carriage permitted (ADN)	: T
Equipment required (ADN)	: PP, EX, A
Ventilation (ADN)	: VE01
Number of blue cones/lights (ADN)	: 0

- Rail transport

Classification code (RID)	: F1
Special provisions (RID)	: 363, 640K
Limited quantities (RID)	: 5L
Excepted quantities (RID)	: E1
Packing instructions (RID)	: P001, IBC03, LP01, R001
Mixed packing provisions (RID)	: MP19
Portable tank and bulk container instructions (RID)	: T2
Portable tank and bulk container special provisions (RID)	: TP1
Tank codes for RID tanks (RID)	: LGBF

Transport category (RID) : 3

Special provisions for carriage – Packages (RID) : W12

Colis express (express parcels) (RID) : CE4

Hazard identification number (RID) : 30

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**
3(a)	HEATING OIL ; Fuels, diesel, no. -2	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 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F
3(b)	HEATING OIL ; Fuels, diesel, no. -2	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)	HEATING OIL ; Fuels, diesel, no. -2	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
40.	HEATING OIL ; Fuels, diesel, no. -2	Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.

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

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 2, Significantly hazardous to water (Classification according to AwSV; ID No. 76).

Major Accidents Ordinance (12. BImSchV) : Listed in the 12. BImSchV (Annex I) under: 2.3.3
- Quantity threshold for operational area under § 1 para. 1
  - Sentence 1 :2500000 kg
  - Sentence 2 :25000000 kg

Netherlands

Waterbezwaarlijkheid	:	A (2) - Vergiftig voor in water levende organismen kan in het aquatische milieu op lange termijn schadelijke effecten veroorzaken
SZW-lijst van kankerverwekkende stoffen	:	HEATING 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
	BTT = Breakthrough time (maximum wearing time)
	NOEL: no-observed-effect level
	STOT = Specific Target Organ Toxicity

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

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 Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 2	Carcinogenicity, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

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)
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)
PC13	Fuels
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
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
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
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
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
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]

DISCLAIMER OF LIABILITY The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

Annex to the safety data sheet

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Distribution of substance			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Use as an intermediate	SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15, PROC28		ERC6a	ESVOC SPERC 6.1a.v1
Formulation & (re)packing of substances and mixtures			PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, 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
Use as a fuel		PC13			ERC9a, ERC9b	ESVOC SPERC 9.12c.v1

1. Exposure scenario 01a

Distribution of substance

ES Ref.: 01a ES Type: Worker Version: 2	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, 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) Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, 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
PROC4	Chemical production where opportunity for exposure arises
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
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15	Use as laboratory reagent

Product characteristics

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

Operational conditions

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature,Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

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

	surveillance; identify and implement corrective actions.	
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	E47 - Handle substance within a closed system.	
CS16 - General exposures (open systems)	PPE15 - Wear suitable gloves tested to EN374.	
CS2 - Process sampling	No other specific measures identified.	
Bulk closed loading and unloading	E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374.	
Bulk open loading and unloading	PPE15 - Wear suitable gloves tested to EN374.	
CS6 - Drum and small package filling	PPE15 - Wear suitable gloves tested to EN374.	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
CS36 - Laboratory activities	No other specific measures identified.	
Storage	E84 - Store substance within a closed system.	

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

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):	31000000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	61000
	Maximum daily site tonnage (kg/day)	200000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per 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):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	74,3
	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 (%):	94,9
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,9
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	1000000
	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 dermal irritant effects,Available hazard data do not support the need for a DNEL to be established for other health effects,Risk Management Measures are based on qualitative risk characterisation.

4.2. 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 01b

Use as an intermediate

ES Ref.: 01b ES Type: Worker Version: 2	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, 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	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, 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
PROC4	Chemical production where opportunity for exposure arises
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
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

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

Operational conditions

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Assumes activities are at ambient temperature (unless stated differently),Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of	

	basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General measures (Flammability)	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures (Aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.	
General exposures (closed systems)	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure.	
CS16 - General exposures (open systems)	PPE15 - Wear suitable gloves tested to EN374,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.	
CS2 - Process sampling	Wear suitable gloves tested to EN374,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.	
Bulk closed loading and unloading	E47 - Handle substance within a closed system,Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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.	
Bulk open loading and unloading	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance,Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Clear spills immediately	
CS36 - Laboratory activities	No other specific measures identified,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Put lids on	

	containers immediately after use.	
CS85 - Bulk product storage	E84 - Store substance within a closed system.	

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

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):	860000
	Fraction of regional tonnage used locally:	0,017
	Annual site tonnage (tons/year):	15000
	Maximum daily site tonnage (kg/day)	50000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per 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,Prevent discharge of undissolved substance to or recover from onsite wastewater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	80
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	89,5
	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 (%):	94,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,8
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	100000
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
	Not applicable as there is no release to wastewater	
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 dermal irritant effects,Available hazard data do not support the need for a DNEL to be established for other health effects,Risk Management Measures are based on qualitative risk characterisation.

4.2. 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 02

Formulation & (re)packing of substances and mixtures

ES Ref.: 02 ES Type: Worker Version: 2	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, PROC28 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, 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
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
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
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

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

Operational conditions

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	8 h
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Assumes activities are at ambient temperature (unless stated differently).	

Risk management measures

Other risk management measures:

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are	

	informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General measures (Flammability)	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures (Aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.	
General exposures (closed systems)	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure.	
CS16 - General exposures (open systems)	PPE15 - Wear suitable gloves tested to EN374,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.	
Batch processes at elevated temperatures	Provide extract ventilation to points where emissions occur,Handle substance within a closed system,Assumes process temperature up to 60 °C	
CS2 - Process sampling	Wear suitable gloves tested to EN374,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.	
CS8 - Drum/batch transfers	Use drum pumps or carefully pour from container,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
CS14 - Bulk transfers	E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374,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.	
CS30 - Mixing operations (open systems)	Provide extract ventilation to points where emissions occur,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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.	
CS100 - Production or preparation or articles by tabletting, compression, extrusion or pelletisation	PPE15 - Wear suitable gloves tested to EN374.	

CS6 - Drum and small package filling	PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	No other specific measures identified,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Put lids on containers immediately after use.	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Clear spills immediately	
Storage	E84 - Store substance within a closed system.	

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

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):	27000000
	Fraction of regional tonnage used locally:	0,001
	Annual site tonnage (tons/year):	30000
	Maximum daily site tonnage (kg/day)	100000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per 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):	0,01
	Release fraction to wastewater from process (initial release prior to RMM):	0,00002
	Release fraction to soil from process (initial release prior to RMM):	0,0001

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,Prevent discharge of undissolved substance to or recover from onsite wastewater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	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 ≥ (%):	92,1
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	

the site		
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,8
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	150000
	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 dermal irritant effects,Available hazard data do not support the need for a DNEL to be established for other health effects,Risk Management Measures are based on qualitative risk characterisation.

4.2. 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 12a

Use as a fuel

ES Ref.: 12a ES Type: Worker Version: 2	

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 additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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, With potential for aerosol generation
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure < 0,5 kPa at STP

Operational conditions

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Assumes activities are at ambient temperature (unless stated differently),Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance	

	likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General measures (Flammability)	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures (Aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.	
CS14 - Bulk transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
CS8 - Drum/batch transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
General exposures (closed systems)	Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure.	
Use as a fuel,CS107 - (closed systems)	Handle substance within a closed system	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Clear spills immediately	
Storage	E84 - Store substance within a closed system.	

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

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):	3400000
	Fraction of regional tonnage used locally:	0,44
	Annual site tonnage (tons/year):	1500000
	Maximum daily site tonnage (kg/day)	5000000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	300
Environmental factors not influenced by risk	Local freshwater dilution factor:	10

management	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,005
	Release fraction to wastewater from process (initial release prior to RMM):	0,00000055
	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 ≥ (%):	94,2
	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	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,8
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	5500000
	Assumed domestic sewage treatment plant flow (m³/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,External treatment and disposal of waste should comply with applicable local and/or national regulations.	
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 dermal irritant effects,Available hazard data do not support the need for a DNEL to be established for other health effects,Risk Management Measures are based on qualitative risk characterisation.

4.2. 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 12b

Use as a fuel

ES Ref.: 12b ES Type: Worker Version: 2	

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 additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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, With potential for aerosol generation
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure < 0,5 kPa at STP

Operational conditions

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Assumes activities are at ambient temperature (unless stated differently),Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance	

	likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General measures (Flammability)	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures (Aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.	
CS14 - Bulk transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
CS8 - Drum/batch transfers	Use drum pumps or carefully pour from container,Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
refuelling	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Ensure no splashing occurs during transfer.	
General exposures (closed systems)	Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure.	
Use as a fuel,CS107 - (closed systems)	Handle substance within a closed system	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance,Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee 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,Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply,Wear suitable coveralls to prevent exposure to the skin,Clear spills immediately	
Storage	E84 - Store substance within a closed system.	

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

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):	5300000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	2700
	Maximum daily site tonnage (kg/day)	7300
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,005
	Release fraction to wastewater from process (initial release prior to RMM):	0,000001
	Release fraction to soil from process (initial release prior to RMM):	0,00025

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 the freshwater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency 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	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,8
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	170000
	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,External treatment and disposal of waste should comply with applicable local and/or national regulations.	
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 dermal irritant effects,Available hazard data do not support the need for a DNEL to be established for other health effects,Risk Management Measures are based on qualitative risk characterisation.

4.2. 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 12c

Use as a fuel

ES Ref.: 12c ES Type: Consumer Version: 2	

Use descriptors	PC13 ERC9a, ERC9b ESVOC SPERC 9.12c.v1
Processes, tasks activities covered	Covers consumer uses in liquid fuels. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC13)

PC13	Fuels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Amount used	Unless otherwise stated,Amounts used	37500 g
Frequency and duration of use	Covers use up to	1 events per day
Other given operational conditions affecting consumers exposure	General measures (skin irritants)	Ensure there is no direct skin contact with product.
	General measures (Flammability)	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.
	General measures (Aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
	Covers use at ambient temperatures,Unless otherwise stated	
	Fuels,Liquid: Automotive Refuelling	Unless otherwise stated. Covers concentrations up to 100%. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 44000 g. Covers exposure up to 0,05. Hours/event. Covers outdoor use. Assumes that potential dermal contact is limited to inside hands/one hand/palm of hands.
	Fuels,Liquid: Garden equipment - Refuelling	Unless otherwise stated. Covers concentrations up to 100%. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 750 g. Covers exposure up to 0,033. Hours/event. Assumes that potential dermal contact is limited to inside hands/one hand/palm of hands.
	Fuels,Liquid: Home space heater fuel	Unless otherwise stated. Covers concentrations up to

		100%. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 3320 g. Covers exposure up to 0,033. Hours/event. Assumes that potential dermal contact is limited to inside hands/one hand/palm of hands.

Risk management measures

Other risk management measures:

Fuels,Liquid: Automotive Refuelling	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid: Garden equipment - Refuelling	No specific risk management measure identified beyond those operational conditions stated.	

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

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)

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):	18000000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	9100
	Maximum daily site tonnage (kg/day)	25000
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	Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).	
	Release fraction to air from wide dispersive use (regional only):	0,0001
	Release fraction to wastewater from wide dispersive use:	0,0000002
	Release fraction to soil from wide dispersive use (regional only):	0,00005

Risk management measures

Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,8
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	610000
	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,External treatment and disposal of waste should comply with applicable local and/or national regulations.	
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 consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these source, then they are indicated.

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.

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.