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

1.1. Product identifier

Product form : Substance
Trade name/designation : FUELS, DIESEL
Chemical name : Fuels, diesel
EC Index : 649-224-00-6
EC-No. : 269-822-7
CAS-No. : 68334-30-5
REACH registration No : 01-2119484664-27-0186
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 uses,Professional use
Use of the substance/mixture : Fuels
see attached exposure scenario.

Title	Use descriptors
Use as an intermediate (ES Ref.: 01b)	SU8, SU9, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
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 in oil and gas field drilling and production operations (ES Ref.: 07)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, ERC4, QUALITATIVE ASSESSMENT FOR ENVIRONMENT
Functional fluids (ES Ref.: 09)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, ERC7, ESVOC SPERC 7.13a.v1
Use as a fuel (ES Ref.: 12a)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC7, ESVOC SPERC 7.12a.v1
Use as a fuel (ES Ref.: 12b)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, 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, ERC2, ESVOC SPERC 2.2.v1

Full text of use descriptors: see section 16

1.2.2. Uses advised against

No data 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
Dragana.Cvetkov@nis.eu (REACH)

Manufacturer
NIS a.d. Novi Sad
Narodnog Fronta 12
21000 Novi Sad - Serbia
T + 381 (0) 21 481 1111
Dragana.Cvetkov@nis.eu (REACH)

Only Representative
REACH Law Ltd.
Vänrikinkuja 3 JK 21
02600 Espoo - Finland
T +358(0) 9 412 3055 - F +358 (0) 9 412 3049
sds@reachlaw.fi

1.4. Emergency telephone number

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

Country	Official advisory body	Address	Emergency number
Ireland	National Poisons Information Centre Beaumont Hospital	Beaumont Hospital Beaumont Road 9 Dublin	+353 1 809 21 66 (public, 8am - 10pm, 7/7) +353 01 809 2566 (Professionals, 24/7)
United Kingdom	National Poisons Information Service (Newcastle Centre) Regional Drugs and Therapeutics Centre, Wolfson Unit	Claremont Place Newcastle-upon-Tyne NE1 4LP Newcastle	0844 892 0111 (UK only, 24/7, healthcare professionals only)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flam. Liq. 3	H226
Acute Tox. 4 (Inhalation)	H332
Skin Irrit. 2	H315
Carc. 2	H351
STOT RE 2	H373
Asp. Tox. 1	H304
Aquatic Chronic 2	H411

Full text of H statements : see section 16

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS02 GHS07 GHS08 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) : P261 - Avoid breathing vapours.
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER/doctor
P331 - Do NOT induce vomiting.
P501 - Dispose of contents/container to .

Listed in Annex VI : EC Index-No. : 649-224-00-6

2.3. Other hazards

Other hazards : PBT/vPvB data. This substance does not meet the PBT/vPvB criteria of REACH,

annex XIII. This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name : FUELS, DIESEL
CAS-No. : 68334-30-5
EC-No. : 269-822-7
EC Index : 649-224-00-6

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Fuels, diesel	(CAS-No.) 68334-30-5 (EC-No.) 269-822-7 (EC Index) 649-224-00-6 (REACH-no) 01-2119484664-27-0186	100	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

Full text of H-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. See also section 8 . Treat symptomatically. Never give anything by mouth to an unconscious person. Show this safety data sheet to the doctor in attendance. In case of doubt or persistent symptoms, consult always a physician.

Inhalation : Keep at rest. Provide fresh air. In case of doubt or persistent symptoms, consult always a physician.

Skin contact : Remove contaminated clothing and shoes. Wash with plenty of water/. In case of doubt or persistent symptoms, consult always a physician.

Eyes contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical advice/attention.

Ingestion : Do NOT induce vomiting. Rinse mouth. Rinse mouth immediately and drink plenty of water. Get medical advice/attention.

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

Inhalation : Harmful if inhaled. May cause respiratory irritation.

Skin contact : Causes skin irritation.

Eyes contact : Contact with eyes may cause irritation.

Ingestion : May be fatal if swallowed and enters airways. May cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

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

No data available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, Alcohol resistant foam, Carbon dioxide, Dry extinguishing powder.

Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Flammable liquid and vapour. Hazardous decomposition products COx,H2S,SOx. Do not allow run-off from fire-fighting to enter drains or water courses.

5.3. Advice for firefighters

Firefighting instructions : Special protective equipment for firefighters. . In case of fire: Wear self-contained breathing apparatus. Use water spray or fog for cooling exposed containers. Evacuate personnel to a safe area. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

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 personnel to a safe area. Use personal protective equipment as required. Reference to other sections: 8. Avoid contact with skin, eyes and clothing. Do not breathe vapour/aerosol. Vapours may form explosive mixture with air. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ensure equipment is adequately earthed.

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.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Stop leak if safe to do so. Dam up. Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Collect in closed and suitable containers for disposal. After cleaning, flush traces away with water. Dispose of contaminated materials in accordance with current regulations.

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. Avoid contact with skin, eyes and clothing. Do not breathe vapour/aerosol. Take precautionary measures against static discharges. Ensure equipment is adequately earthed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take any precaution to avoid mixing with combustibles... See also section 10. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Do not allow to enter into surface water or drains.

Hygiene measures : Keep good industrial hygiene. When using do not eat, drink or smoke. Wash hands and face before breaks and immediately after handling of the product. Take off contaminated clothing. Separate working clothes from town clothes. Keep away from food, drink and animal feedingstuffs.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Refer to the detailed list of incompatible materials in section 10 Stability/Reactivity. Keep only in the original container. Keep container tightly closed in a cool, well-ventilated place.

Packaging materials : Keep only in the original container.

7.3. Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Fuels, diesel (68334-30-5)		
Belgium	Limit value (mg/m³)	100 mg/m³ (aerosol and vapor)
Ireland	OEL (8 hours ref) (mg/m³)	100 mg/m³
Ireland	OEL (15 min ref) (mg/m3)	300 mg/m³ (calculated)
Poland	NDS (mg/m³)	0,5 mg/m³ (respirable fraction)
Portugal	OEL TWA (mg/m³)	100 mg/m³ (aerosol and vapor)
USA - ACGIH	ACGIH TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)

FUELS, DIESEL (68334-30-5)	
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

8.2. Exposure controls

Engineering measure(s) : Provide adequate ventilation. Use only in area provided with appropriate exhaust ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Take precautionary measures against static discharge. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Organisational measures to prevent /limit releases, dispersion and exposure. See also section 7.

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 : The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves. rubber gloves. (EN 374). Breakthrough time : : >480min. Wear chemically resistant gloves (tested to EN374) . NBR (Nitrile rubber)

Eye protection : Safety glasses (EN 166)

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) (EN 140). full face mask (DIN EN 136) (EN 136). Filter type: A (EN 141)

Thermal hazard protection : Not required for normal conditions of use. Use dedicated equipment.

Environmental exposure controls : Do not allow to enter into surface water or drains. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid

Colour : No data available.

Odour : Characteristic.

Odour threshold	:	No data available No data available
pH	:	Not applicable
Relative evaporation rate (butylacetate=1)	:	No data available
Melting / freezing point	:	No data available
Freezing point	:	No data available
Initial boiling point and boiling range	:	163 - 375 °C
Flash point	:	> 55 °C
Auto-ignition temperature	:	250-460 °C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	Not applicable,liquid
Vapour pressure	:	No data available
Vapour density	:	No data available
Relative density	:	0,820 - 0,845 g/cm³ (15°C)
Solubility	:	Water: < 20 mg/l
Partition coefficient n-octanol/water	:	3,9-6
Kinematic viscosity	:	4,574 mm²/s @ 20°C
Dynamic viscosity	:	No data available
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.
Explosive limits	:	0,6 vol % 6,5 vol %

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Flammable liquid. Reference to other sections: 10.5.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4. Conditions to avoid

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames. See also section 7. Handling and storage.

10.5. Incompatible materials

Incompatible with strong acids and oxidizing agents. Bases. See also section 7. Handling and storage.

10.6. Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. Reference to other sections: 5.2.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Inhalation: Harmful if inhaled.

Fuels, diesel (68334-30-5)	
LD50/oral/rat	> 2000 mg/kg

Fuels, diesel (68334-30-5)	
LD50/dermal/rabbit	> 2000 mg/kg
LC50/inhalation/4h/rat	4,1 mg/l/4h

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.)

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 (68334-30-5)	
NOAEL (dermal, rat/rabbit, 90 days)	30 mg/kg bodyweight/day

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

FUELS, DIESEL (68334-30-5)	
Kinematic viscosity	4,574 mm²/s @ 20°C

Other information : Symptoms related to the physical, chemical and toxicological characteristics.
Reference to other sections: 4.2.

SECTION 12: Ecological information

12.1. Toxicity

Environmental properties : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Fuels, diesel (68334-30-5)	
LC50 fish 1	21 mg/l (96 h)
EC50 Daphnia 1	68 mg/l (48h)
EC50 other aquatic organisms 1	> 1000 mg/l (40 h)
ErC50 (algae)	22 mg/l (72 h)
NOEC chronic fish	0,083 mg/l
NOEC chronic crustacea	0,2 mg/l

12.2. Persistence and degradability

FUELS, DIESEL (68334-30-5)	
Persistence and degradability	Readily biodegradable.

12.3. Bioaccumulative potential

FUELS, DIESEL (68334-30-5)	
Partition coefficient n-octanol/water	3,9-6

Fuels, diesel (68334-30-5)	
Partition coefficient n-octanol/water	study scientifically unjustified

12.4. Mobility in soil

FUELS, DIESEL (68334-30-5)	
Ecology - soil	No data available.

Fuels, diesel (68334-30-5)	
Surface tension	not relevant

12.5. Results of PBT and vPvB assessment

No data available

12.6. Other adverse effects

Additional information : Do not allow to enter into surface water or drains

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Handle with care. Safe handling: see section 7. Handling and storage. Refer to manufacturer/supplier for information on recovery/recycling. Collect and dispose of waste product at an authorised disposal facility. Dispose of contaminated materials in accordance with current regulations.

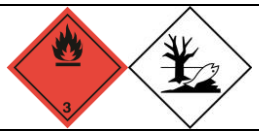
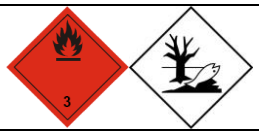
Additional information : Never use pressure to empty container. Do not burn, or use a cutting torch on the empty drum. Do not puncture or incinerate. Delivery to an approved waste disposal company. Dispose of contaminated materials in accordance with current regulations.

Further ecological information : Do not allow to enter into surface water or drains.

European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC) : Classified as hazardous waste according to European Union regulations.
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.
The following Waste Codes are only suggestions:
130701 - fuel oil and diesel
150110 - packaging containing residues of or contaminated by dangerous substances

SECTION 14: Transport information

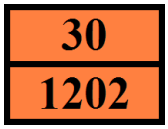
In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
1202	1202	1202	1202	1202
14.2. UN proper shipping name				
DIESEL FUEL	DIESEL FUEL	Diesel fuel	DIESEL FUEL	DIESEL FUEL
Transport document description				
UN 1202 DIESEL FUEL, 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 1202 DIESEL FUEL, 3, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1202 Diesel fuel, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 1202 DIESEL FUEL, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 1202 DIESEL FUEL, 3, III, ENVIRONMENTALLY 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
ADN :N2				

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	:	
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. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

3(b) 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	FUELS, DIESEL - Fuels, diesel
3(c) 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	FUELS, DIESEL - Fuels, diesel
3. Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008	FUELS, DIESEL - Fuels, diesel
3(a) 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	FUELS, DIESEL - Fuels, diesel

FUELS, DIESEL is not on the REACH Candidate List

FUELS, DIESEL is not on the REACH Annex XIV List

15.1.2. National regulations

Germany

Reference to AwSV	:	Water hazard class (WGK) 2, significant hazard to water (Classification according to VwVwS, Annex 1 or 2; ID No. 76)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV	:	Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

Waterbezwaarlijkheid	:	6 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. (A)
SZW-lijst van kankerverwekkende stoffen	:	FUELS, DIESEL is listed
SZW-lijst van mutagene stoffen	:	FUELS, DIESEL is listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding	:	The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid	:	The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling	:	The substance is not listed

Denmark

Classification remarks	:	Emergency management guidelines for the storage of flammable liquids must be followed
Recommendations Danish Regulation	:	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

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:

16	Other information	Modified	
	Exposure scenarios	Modified	

Abbreviations and acronyms:

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

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

Sources of key data used to compile the datasheet : European Chemicals Bureau : ecb.jrc.it CSR, SDS supplier.

Other information : Assessment/classification CLP. Article 9. Calculation method.

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 of preparations
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b	Industrial use of reactive processing aids
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
ERC9a	Wide dispersive indoor use of substances in closed systems

ERC9b	Wide dispersive outdoor use of substances in closed systems
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 7.13a.v1	Functional fluids: 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	Use in closed process, no likelihood of exposure
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC15	Use as laboratory reagent
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
QUALITATIVE ASSESSMENT FOR ENVIRONMENT	
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) 2015/830
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Annex to the safety data sheet

Annex : Identified uses

Title	Sector of use	Product category	Process category	Article category	Environmental release	SPERC
Use as an intermediate	SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Distribution of substance			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Formulation & (re)packing of substances and mixtures			PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15		ERC2	ESVOC SPERC 2.2.v1
Use in oil and gas field drilling and production operations			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b		ERC4	QUALITATIVE ASSESSMENT FOR ENVIRONMENT
Functional fluids			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9		ERC7	ESVOC SPERC 7.13a.v1
Use as a fuel			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC7	ESVOC SPERC 7.12a.v1
Use as a fuel			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC9a, ERC9b	ESVOC SPERC 9.12b.v1
Use as a fuel		PC13			ERC9a,	ESVOC SPERC

1. Exposure scenario 01b

Use as an intermediate

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

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 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). Industrial use
Assessment method	ECETOC TRA worker v3 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, PROC15)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent

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	Operation is carried out at elevated temperature (> 20°C above ambient temperature),Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures 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.	
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.	
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	Industrial use resulting in manufacture of another substance (use of intermediates)
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):	1000000
	Fraction of regional tonnage used locally:	0,015
	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):	0,00024
	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 ≥ (%):	94,4
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	94,9
	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):	55000
	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 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. Industrial use
Assessment method	ECETOC TRA worker v3 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	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or mixture 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	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b	Industrial use of reactive processing aids
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
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):	0,001
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0.00001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	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 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 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	ECETOC TRA worker v3 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)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
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).	8 h
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.	
Batch processes at elevated temperatures	Provide extract ventilation to points where emissions occur	
CS2 - Process sampling	No other specific measures identified.	
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.	
CS14 - Bulk transfers	E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374.	
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.	
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.	
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.	
Storage	E84 - Store substance within a closed system.	

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

ERC2	Formulation of preparations
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):	30000000
	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):	0,00012
	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 ≥ (%):	94,4
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	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):	110000
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
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 07

Use in oil and gas field drilling and production operations

ES Ref.: 07 ES Type: Worker Version: 2	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b ERC4 QUALITATIVE ASSESSMENT FOR ENVIRONMENT
Processes, tasks activities covered	Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance. Industrial use
Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

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	
CS14 - Bulk transfers	E52 - Transfer via enclosed lines.	
CS45 - Filling/ preparation of equipment from drums or containers.	PPE15 - Wear suitable gloves tested to EN374.	
CS115 - Drilling mud (re-)formulation	No other specific measures identified.	
CS116 - Drill floor operations	PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
CS117 - Operation of solids filtering equipment,Elevated temperature	E71 - Provide the operation with a properly sited receiving hood.	
CS120 - Cleaning of solids filtering equipment	PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Cuttings treatment and disposal	Provide extract ventilation to points where emissions occur	
CS2 - Process sampling	No other specific measures identified.	
General exposures (closed systems)	E47 - Handle substance within a closed system.	
CS16 - General exposures (open systems)	PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Pouring from small containers	PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
CS39 - Equipment cleaning and maintenance	PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Storage	E84 - Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, QUALITATIVE ASSESSMENT FOR ENVIRONMENT)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
QUALITATIVE ASSESSMENT FOR ENVIRONMENT	

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	1
	Regional use tonnage (tons/year):	20000
	Fraction of regional tonnage used locally:	Not applicable
	Annual site tonnage (tons/year):	Not applicable
	Maximum daily site tonnage (kg/day)	Not applicable
Frequency and duration of use	Number of emission days per year	Not applicable
Environmental factors not influenced by risk management	Local marine water dilution factor:	Not applicable
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	Not applicable
	Release fraction to wastewater from process (initial release prior to RMM):	Not applicable

Risk management measures

Technical conditions and measures at process level to prevent release	Discharge to aquatic environment is restricted (see Section 4.2).	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	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 ≥ (%):	Not applicable

	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	Not applicable
Organizational measures to prevent/limit release from the site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	Not applicable
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	Not applicable
	Assumed domestic sewage treatment plant flow (m^3/d):	Not applicable
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	Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment,Qualitative approach used to conclude safe use

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	Discharge to aquatic environment is restricted by law and industry prohibits release.

1. Exposure scenario 09

Functional fluids

ES Ref.: 09 ES Type: Worker Version: 2	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 ERC7 ESVOC SPERC 7.13a.v1
Processes, tasks activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers. Industrial use
Assessment method	ECETOC TRA worker v3 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)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

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	
CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	PPE15 - Wear suitable gloves tested to EN374.	
CS84 - Filling of articles/equipment,CS107 - (closed systems)	E52 - Transfer via enclosed lines.	
CS45 - Filling/ preparation of equipment from drums or containers.	PPE15 - Wear suitable gloves tested to EN374.	
equipment operation,CS107 - (closed systems)	No other specific measures identified.	
equipment operation,CS108 - (open systems)	restrict area of openings and provide extract ventilation to emission points when substance handled at elevated temperatures	
CS86 - Rework of articles,CS19 - Remanufacture of reject articles	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.	
Storage	E84 - Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.13a.v1)

ERC7	Industrial use of substances in closed systems
ESVOC SPERC 7.13a.v1	Functional fluids: 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):	1500
	Fraction of regional tonnage used locally:	0,0069
	Annual site tonnage (tons/year):	10
	Maximum daily site tonnage (kg/day)	500
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,005
	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 the freshwater,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 ≥ (%):	29,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal	0

	efficiency of ≥ (%):	
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 (%):	94,9
	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):	7000
	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, PROC3, PROC8a, PROC8b, PROC16 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. Industrial use
Assessment method	ECETOC TRA worker v3 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, PROC8a, PROC8b, PROC16)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

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	
CS14 - Bulk transfers	PPE15 - Wear suitable gloves tested to EN374.	
CS8 - Drum/batch transfers	PPE15 - Wear suitable gloves tested to EN374.	
Use as a fuel,CS107 - (closed systems)	No other specific measures identified.	
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.	
Storage	E84 - Store substance within a closed system.	

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

ERC7	Industrial use of substances in closed systems
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):	3700000
	Fraction of regional tonnage used locally:	0,4
	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 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):	0,0000024
	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 ≥ (%):	94,4
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	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	5500000

	(kg/d):	
	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 12b

Use as a fuel

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

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 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. Professional use
Assessment method	ECETOC TRA worker v3 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, PROC8a, PROC8b, PROC16)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

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	
CS14 - Bulk transfers	PPE15 - Wear suitable gloves tested to EN374.	
CS8 - Drum/batch transfers	Use drum pumps or carefully pour from container,PPE15 - Wear suitable gloves tested to EN374.	
refuelling	PPE15 - Wear suitable gloves tested to EN374.	
Use as a fuel,CS107 - (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour),or,Ensure operation is undertaken outdoors.	
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.	
Storage	E84 - Store substance within a closed system.	

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

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
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):	6900000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	3400
	Maximum daily site tonnage (kg/day)	9400
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):	0,0001
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0,00001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	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 ≥ (%):	34,3
	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	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via	94,9

	domestic sewage treatment (%):	
	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):	120000
	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
Assessment method	ECETOC TRA worker v3 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).
Vapour pressure	Liquid, vapour pressure > 10 Pa.

Operational conditions

Amount used	Unless otherwise stated,Amounts used	37500 g
Frequency and duration of use	Unless otherwise stated,Covers use up to	0,143 Uses per day
	Covers exposure up to	2 Hours/event
Human factors not influenced by risk management	Covers skin contact area up to,Unless otherwise stated	420 cm²
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of,Covers use under typical household ventilation.	20 m³
	Fuels,Liquid: Automotive Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 52. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm2. For each use event, covers use amounts up to: 37500 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 0,05. Hours/event
	Fuels,Liquid, Garden equipment - Use	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 750 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 2,00. Hours/event
	Fuels,Liquid: Garden equipment - Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 26.

		days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 420 cm2. For each use event, covers use amounts up to: 750 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34m3. Covers exposure up to 0,03. Hours/event
	Fuels,Liquid: Home space heater fuel	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 120. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm2. For each use event, covers use amounts up to: 1500 g. Covers use in room size of 20m3. Covers exposure up to 0,03. Hours/event

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 - Use	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	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
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):	19000000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	9600
	Maximum daily site tonnage (kg/day)	26000
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):	0,001
	Release fraction to wastewater from wide dispersive use:	0,00001
	Release fraction to soil from wide dispersive use (regional only):	0,00001

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 (%):	94,9
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	300000

	(kg/d):	
	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 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.