SAFETY DATA SHEET

For Fuels, diesel

Version No	4.1
Last Updated	8 Feb 2013
Supersedes	3.1

To	Sean Salt
From	HARVEST ENERGY LIMITED
Unique Reference No.	ULSD2015
Date	14 Jan 2015 16:08

1.IDENTIFICATION OF THE SUBSTANCE/MIXTURE

1.1 Product identifier

CAS	68334-30-5 : EC No. 269-822-7 : EC Index 649-224-00-6	Substance Synonyms	Fuels, diesel
ECHA Registration No.	01-2119484664-27-0174 - HARVEST ENERGY LIMITED		
Commercial Product Name	DIESEL		

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

Exposure Scenario(s)	VGO ES	Chemical Safety Report	Not Applicable
Specific Use(s)			
Uses Advised Against	All other uses because their risks have not been assessed.		

1.3 Details of the supplier of the SDS

Company	HARVEST ENERGY LIMITED York House 45 Seymour Street London W1H 7JT UNITED KINGDOM	Telephone No. Email Fax	+44(0) 20 7580 0033 opsharvest@harvestenergy.co.uk +44(0) 20 7580 0334

1.4 Emergency telephone number

Emergency telephone number	+44(0)1865 407333 (Carechem 24 24hr Emergency contact number)	Anti-Poisoning Centre Number	
Opening Hours	Available 24/7/365		

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

2.1.1. Classification according to Regulation (EU) 1272/2008

CLP-Classification : The product is classified as hazardous in accordance with Regulation (EC) No. 1272/2008.

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

Full text of H-phrases: see section 16

2.1.2. Classification according to EU Directives 67/548/EEC or 1999/45/EC

Classification : The product is classified as dangerous in accordance with Directive 67/548/EEC.

Carc.Cat.3; R40
Xn; R20
Xn; R65
Xi; R38
N; R51/53

Full text of R-phrases: see section 16

2.2. Label elements

2.2.1. Labelling according to Regulation (EU) 1272/2008

CLP pictograms :

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 or doctor/ physician.
P331 - Do NOT induce vomiting.
P501 - Dispose of contents/ container to an approved waste disposal plant.

2.2.2. Labelling according to Directives (67/548 - 1999/45)

Not relevant

2.3. Other hazards

Other hazards which do not result in classification : This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name	Product identifier	%	Classification according to Directive 67/548/EEC
Fuels, diesel	(CAS No.) 68334-30-5	100	Carc.Cat.3; R40 Xn; R20 Xn; R65 Xi; R38 N; R51/53

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Fuels, diesel	(CAS No.) 68334-30-5	100	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

Full text of R-, H- and EUH-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation : Keep at rest.
Move to fresh air.
Consult a physician if necessary.
If unconscious place in recovery position and seek medical advice.
Oxygen or artificial respiration if needed.

Skin contact : Remove contaminated clothing and shoes.
After contact with skin, wash immediately with plenty of water and soap.
If skin irritation persists, call a physician.
In the event of a high pressure injection injury, worker should obtain immediate medical assistance.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Obtain medical attention.

Ingestion : Do NOT induce vomiting.
Rinse mouth.
Drink plenty of water.
Obtain medical attention.

Additional advice : First aider needs to protect himself.
See also section 8 .
Treat symptomatically.
Never give anything by mouth to an unconscious person or a person with cramps.
Show this safety data sheet to the doctor in attendance.
When symptoms persist or in all cases of doubt seek medical advice.

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

Inhalation	:	Harmful if inhaled. May cause irritation of respiratory tract.
Skin contact	:	Causes skin irritation.
Eye contact	:	Contact with eyes may cause irritation.
Ingestion	:	May be fatal if swallowed and enters airways. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
Other adverse effects	:	Suspected of causing cancer.

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	:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Extinguishing media which shall not be used for safety reasons	:	High volume water jet

5.2. Special hazards arising from the substance or mixture

Fire hazard	:	Flammable liquid and vapour.
Specific hazards	:	Vapours may form explosive mixture with air. Vapours are heavier than air and may spread along floors. The pressure in sealed containers can increase under the influence of heat. Possible decomposition products are: COx As appropriate : hydrogen sulphide (H_2S). SOx Sulphuric acid Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

5.3. Advice for firefighters

Advice for firefighters	:	Special protective equipment for firefighters . In the event of fire, wear self-contained breathing apparatus. In the event of fire, cool tanks with water spray. Evacuate personnel to safe areas. 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

Advice for non-emergency personnel : Ensure adequate ventilation.
Evacuate personnel to safe areas.
Wear personal protective equipment.
See also section 8
Avoid contact with skin, eyes and clothing.
Do not breathe vapours or spray mist.
Vapours may form explosive mixture with air.
Vapours are heavier than air and may spread along floors.
Keep away from open flames, hot surfaces and sources of ignition.
Ensure all equipment is electrically grounded before beginning transfer operations.
Material can create slippery conditions.
As appropriate :
Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

Advice for emergency responders : Only qualified personnel equipped with suitable protective equipment may intervene.
See also section 8.

6.2. Environmental precautions

Environmental precautions : Prevent product from entering drains.
Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Prevent further leakage or spillage if safe to do so.
Dam up.
Soak up with inert absorbent material.
Sweep up and shovel into suitable containers for disposal.
If liquid has been spilt in large quantities clean up promptly by scoop or vacuum.
After cleaning, flush away traces with water.
Dispose of in accordance with local regulations.

6.4. Reference to other sections

See also section 8
See also section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling : Provide adequate information, instruction and training for operators.
Ensure adequate ventilation.
Wear personal protective equipment.
See also section 8.
Avoid contact with skin, eyes and clothing.
Do not breathe vapours or spray mist.
Take precautionary measures against static discharges.
Ensure all equipment is electrically grounded before beginning transfer operations.
Keep away from open flames, hot surfaces and sources of ignition.
Take any precaution to avoid mixing with incompatible materials.
See also section 10.
Take care to avoid waste and spillage when weighing, loading and mixing the product.
Do not use compressed air for filling, discharging or handling.
Do not let product enter drains.
As appropriate :
Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
When using, do not eat, drink or smoke.
Wash hands before breaks and immediately after handling the product.
Remove and wash contaminated clothing before re-use.
Keep working clothes separately.
Keep away from food, drink and animal feedingstuffs.

7.2. Conditions for safe storage, including any incompatibilities

Storage : Do not store near or with any of the incompatible materials listed in section 10.
Store in original container.
Keep tightly closed in a dry, cool and well-ventilated place.
Keep in a bunded area.
As appropriate :
Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.
Keep away from direct sunlight.

Packaging material : Store in original container.
Mild steel
Stainless steel

7.3 Specific end use(s)

see attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit(s) :

CAS 68334-30-5(68334-30-5)		
Belgium	Limit value (mg/m³)	100 mg/m³

CAS 68334-30-5(68334-30-5)		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³
Ireland	OEL (8 hours ref) (mg/m3)	100 mg/m³
Poland	NDS (mg/m3)	0,5 mg/m³

Fuels, diesel (68334-30-5)		
Belgium	Limit value (mg/m³)	100 mg/m³
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³
Ireland	OEL (8 hours ref) (mg/m3)	100 mg/m³
Poland	NDS (mg/m3)	0,5 mg/m³

Recommended monitoring procedures : Concentration measurement in air
Personal monitoring

CAS 68334-30-5(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

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.

Respiratory protection : In case of insufficient ventilation wear suitable respiratory equipment.
Respirator with a half face mask (EN 140)
Respirator with a full face mask (EN 136)
Recommended Filter type: A (EN 141) / ABEK (H2S) (EN141)
Self-contained open-circuit compressed air breathing apparatus (EN 137)

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) Nitrile rubber Break through time : >480min

Eye protection : Goggles, Face-shield (EN 166).

Skin and body protection : Chemical-resistant overalls
Protective helmets
Antistatic boots

Thermal hazard protection : Not required under normal use.
Use dedicated equipment.

Engineering measures : Ensure adequate ventilation.
Use only in area provided with appropriate exhaust ventilation.
Ensure that eyewash stations and safety showers are close to the workstation location.
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

		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
Environmental exposure controls	:	Do not flush into surface water or sanitary sewer system. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	:	liquid
Colour	:	no data available
Odour	:	characteristic
Odour Threshold	:	No data available
Odour Threshold	:	No data available
pH	:	Not applicable
Melting point/range	:	-40 - 6 °C
Boiling point/boiling range	:	141 - 462 °C
Flash point	:	> 56 °C (closed cup)
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable,liquid
Explosion limits	:	No data available
Vapour pressure	:	0,4 kPa @ 40°C
Vapour density	:	No data available
Density	:	0,8 - 0,91 g/cm³
Relative density	:	No data available
Water solubility	:	< 20 mg/l (at 20 °C)
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	>= 225 °C
Decomposition temperature	:	No data available
Viscosity	:	> 1,5 mm²/s
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.
Oxidizing 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.

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	Flammable liquid See also section 10.5

10.2. Chemical stability

Stability : Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions : Vapours may form explosive mixtures with air.

10.4. Conditions to avoid

Conditions to avoid : Heat, flames and sparks.
See also section 7
Handling and storage

10.5. Incompatible materials

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 : Carbon oxides As appropriate : hydrogen sulphide (H2S). SOx Sulphuric acid

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if inhaled.

CAS 68334-30-5(68334-30-5)	
LD50/oral/rat	> 5000 mg/kg
LD50/dermal/rabbit	> 2000 mg/kg
LC50/inhalation/4h/rat	4,6 mg/l (Exposure time: 4 h)

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/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.
Test Method : Dermal, mouse, males, life long, 3x wk, 24µL.

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

Specific target organ toxicity (single exposure) : Not classified (Based on available data, the classification criteria are not met.)

Specific target organ toxicity (repeated exposure) : May cause damage to organs through prolonged or repeated exposure.
Target Organs :
blood
liver
thymus

CAS 68334-30-5(68334-30-5)	
NOAEL (dermal,rat/rabbit,90 days)	30 mg/kg bodyweight/day
Additional information	NOAEC, mammalian, long term, inhalation, rat, systemic : 1710 mg/m³ (90 days)

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

Further information

Symptoms related to the physical, chemical and toxicological characteristics,See section 4.2.

SECTION 12: Ecological information

12.1. Toxicity

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

CAS 68334-30-5(68334-30-5)	
LC50/96h/fish	35 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
Additional information	EL50, aquatic invertebrates, acute, Fresh water, Daphnia magna (Big water flea).: 68 mg/l (48 hours) IL50, aquatic algae, Pseudokirchneriella subcapitata: 22 mg/l (72 hours) LL50, fish, acute, Fresh water, Oncorhynchus mykiss (rainbow trout): 21 mg/l (96 hours) NOEL, aquatic invertebrates, long term, Fresh water, Daphnia magna (Big water flea).: 0.21 mg/l (14 days) NOEL, fish, long term, Fresh water, Oncorhynchus mykiss (rainbow trout): 0.083 mg/l (QSAR)

12.2. Persistence and degradability

Persistence and degradability : Readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulation : Not applicable.
UVCB

Partition coefficient: n-octanol/water : No data available

12.4. Mobility in soil

Mobility : Not applicable
UVCB

12.5. Results of PBT and vPvB assessment

PBT/vPvB : This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects

Further information : Do not flush into surface water or sanitary sewer system.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues / unused products : Handle with care.
See also section 7
Handling and storage
Where possible recycling is preferred to disposal or incineration.
Collect and dispose of waste product at an authorised disposal facility.
Dispose of in accordance with local regulations.

Contaminated packaging : Do not use pressure to empty drums.
Do not burn, or use a cutting torch on, the empty drum.
Do not puncture or incinerate.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Dispose of in accordance with local regulations.

Additional ecological information : Do not flush into surface water or sanitary sewer system.

List of suggested waste codes/waste designations in accordance with the EWC: : 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

14.1. UN number

UN-No. : 1202

14.2. UN proper shipping name

Proper shipping name : GAS OIL
Proper shipping name IATA/IMDG : GAS OIL

14.3. Transport hazard class(es)

14.3.1. Overland transport

Class : 3 - Flammable liquid
Hazard identification number (Kemler No.) : 30
Classification code (ADR) : F1
ADR/RID-Labels : 3 - Flammable liquid

14.3.2. Inland waterway transport (ADN)

ADN : Hazards :3+N2
Class (ADN) : 3

14.3.3. Transport by sea

Class : 3 - Flammable liquids

14.3.4. Air transport

Class : 3 - Flammable liquids

14.4. Packing group

Packing group : III

14.5. Environmental hazards

Environmental hazards : p

Other information : ADN :N2.

14.6 Special precautions for user

No data available

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

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

Restrictions on use :

3. Liquid substances or mixtures, which are regarded as dangerous according to the definitions in Council Directive 67/548/EEC and Directive 1999/45/EC. : CAS 68334-30-5 - Fuels, diesel

This product contains an ingredient according to the candidate list of Annex XIV of the REACH Regulation 1907/2006/EC. : Not applicable.

Authorisations : Not applicable

15.1.2. National regulations

DE: WGK : 2
DE: German storage class (LGK) : LGK 3B - Flammable liquids
DE: TA-Luft : Organic Substances
DE: Technische Regeln für Gefahrstoffe (TRGS) : applicable
DE: Risk classification according to VbF : A III - Liquids with a flashpoint above 55°C up to 100°C
FR : Installations classées : 117X; 143X
NL : ABM : 6 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. (A)
NL: NeR (Nederlandse emissie Richtlijn) : Organic substances in vapour or gaseous form

15.2. Chemical safety assessment

Chemical Safety Assessment : A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of R-, H- and EUH-phrases:

Acute Tox. 4 (Inhalation)	:	Acute toxicity (inhalation) Category 4
Acute Tox. 4 (Inhalation:dust,mist)	:	Acute toxicity 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.
R20	:	Harmful by inhalation.
R38	:	Irritating to skin.
R40	:	Limited evidence of a carcinogenic effect.
R51/53	:	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	:	Harmful: may cause lung damage if swallowed.
N	:	Dangerous for the environment
Xi	:	Irritating
Xn	:	Harmful

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

Safety datasheet sections which have been updated: : 4,5,6,7,8,9,10,11,12,13,14,15,16

Abbreviations and acronyms :
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
CSR = Chemical Safety Report
DNEL = Derived No Effect Level
EC50 = Median Effective Concentration
N = Dangerous for the environment
LC50 = Median lethal concentration
LD50 = Median lethal dose
NOEL = No-observed-effect level
PBT = persistent, bioaccumulating and toxic (PBT).
PNEC = Predicted No Effect Concentration
STEL = Short term exposure limit
TLV = Threshold limits
TWA = time weighted average
vPvB = very persistent and very bioaccumulating
WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
NA = not applicable
UVCB = Substance of unknown or variable composition, complex reaction products or biological material (UVCB)

and EEC Commission Regulation 1907/2006/EC (REACH) Annex II.

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

SUMMARY OF CHANGES

For 68334-30-5

The following changes have been made to this eSDS:

Version 3.1 updated to Version 4.1 - 8 Feb 2013

- Sections 2-16 updated

Version 3.0 updated to Version 3.1 - 3 May 2012

- Use advised against 'All other uses because their risks have not been assessed.' added
- Exposure scenario 'Naphtha ES' added
- Exposure scenario 'Naphtha ES' removed
- Exposure scenario 'VGO ES' added

Version 2.0 updated to Version 3.0 - 1 Jan 2011

- Sections 2-16 updated

Version 1.0 updated to Version 2.0 - 30 Nov 2010

- Sections 2-16 updated

Version - updated to Version 1.0 - 24 Jun 2009

- Sections 2-16 updated

CHAPTER EXPOSURE SCENARIO'S

Title 1 DNEL and PNEC Values

DNEL Worker

Acute exposure	Systemic	Inhalation	4300	mg/m³/15min
Long-Term Exposure	Systemic	Dermal	2,9	mg/kg/8h
	local	Inhalation	68	mg/m³/8h

DNEL General population

Acute exposure	Systemic	Inhalation	2600	mg/m³/15min (for lethality) [aerosol]
Long-Term Exposure	Systemic	Dermal	1,3	mg/kg/24h
	Systemic	Inhalation	20	mg/m³/24h [aerosol]

PNEC Value

PNEC Value	Oral	0	mg/kg food

Title 2 Exposure Scenario's

Identified Use Name	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
01b – Use of Substance as Intermediate	Industrial	ES 9.2.1	3, 8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	NA	6a	ESVOC SpERC 6.1a.v1
01a – Distribution of Substance	Industrial	ES 9.3.1	3	NA	1, 2, 3, 4, 8a, 8b, 9, 15	NA	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7	ESVOC SpERC 1.1b.v1
02 – Formulation & (Re)packing of Substances and Mixtures	Industrial	ES 9.4.1	3, 10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	NA	2	ESVOC SpERC 2.2.v1
03a – Uses in Coatings: Industrial	Industrial	ES 9.5.1	3	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 15	NA	4	ESVOC SpERC 4.3a.v1
03b – Uses in Coatings: Professional	Professional	ES 9.6.1	22	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	NA	8a, 8d	ESVOC SpERC 8.3b.v1
05a – Use in Oil and Gas Field Drilling and Production Operations: Industrial	Industrial	ES 9.7.1	3	NA	1, 2, 3, 4, 8a, 8b	NA	4	QUALITATIVE ASSESSMENT FOR ENVIRONMENT
05b – Use in Oil and Gas field drilling and production operations: Professional	Professional	ES 9.8.1	22	NA	1, 2, 3, 4, 8a, 8b	NA	8d	QUALITATIVE ASSESSMENT FOR ENVIRONMENT
06a – Lubricants: Industrial	Industrial	ES 9.9.1	3	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18	NA	4, 7	ESVOC SpERC 4.6a.v1

Identified Use Name	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
06b – Lubricants: Professional (Low Release)	Professional	ES 9.10.1	22	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	NA	9a, 9b	ESVOC SpERC 9.6b.v1
06c – Lubricants: Professional (High Release)	Professional	ES 9.11.1	22	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	NA	8a, 8d	ESVOC SpERC 8.6c.v1
07a – Use in Metal Working Fluids / Rolling Oils: Industrial	Industrial	ES 9.12.1	3	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17	NA	4	ESVOC SpERC 4.7a.v1
10a – Use as Release Agents or Binders: Industrial	Industrial	ES 9.13.1	3	NA	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14	NA	4	ESVOC SpERC 4.10a.v1
10b – Use as Release Agents or Binders: Professional	Professional	ES 9.14.1	22	NA	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14	NA	8a, 8d	ESVOC SpERC 8.10b.v1
12a – Use as a Fuel: Industrial	Industrial	ES 9.15.1	3	NA	1, 2, 3, 8a, 8b, 16	NA	7	ESVOC SpERC 7.12a.v1
12b – Use as a Fuel: Professional	Professional	ES 9.16.1	22	NA	1, 2, 3, 8a, 8b, 16	NA	9a, 9b	ESVOC SpERC 9.12b.v1
12c – Use as a Fuel: Consumer	Consumer	ES 9.17.1	21	13	NA	NA	9a, 9b	ESVOC SpERC 9.12c.v1
13a – Use as Functional Fluids: Industrial	Industrial	ES 9.18.1	3	NA	1, 2, 3, 4, 8a, 8b, 9	NA	7	ESVOC SpERC 7.13a.v1
15 – Use in Road and Construction Applications: Professional	Professional	ES 9.19.1	22	NA	8a, 8b, 9, 10, 11, 13	NA	8d, 8f	ESVOC SpERC 8.15.v1
18b – Explosives Manufacture & Use: Professional	Professional	ES 9.20.1	22	NA	1, 3, 5, 8a, 8b	NA	8e	ERC DEFINED RELEASE FRACTIONS
19 – Rubber Production and processing: Industrial	Industrial	ES 9.21.1	3, 10, 11	NA	1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 13, 14, 15, 21	NA	1, 4, 6d	ESVOC SpERC 4.19.v1

Section 1	**Exposure Scenario 9.2.1**
Title	**01b - Use of Substance as Intermediate**
Use Descriptor	Sector of Use: Industrial SU3, SU8, SU9
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15
Processes, tasks, activities covered	Use of substance as an intermediate. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
General exposures (Closed systems) CS15	Handle substance within a closed system E47
General exposures (Open systems) CS16	Wear suitable gloves tested to EN374 PPE15
Process Sampling CS2	No other specific measures identified EI20
Bulk closed loading and unloading CS501	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE15
Bulk open loading and unloading CS503	Wear suitable gloves tested to EN374 PPE15
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Laboratory activities CS36	No other specific measures identified EI20
Bulk storage CS85	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	

Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*3,50E+05*
Fraction of Regional tonnage used locally	*0,043*
Annual site tonnage (tonnes/year)	*1,50E+04*
Maximum daily site tonnage (kg/day)	*5,00E+04*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*300*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1,00E-03*
Release fraction to wastewater from process (initial release prior to RMM)	*3,00E-05*
Release fraction to soil from process (initial release prior to RMM)	*0,001*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	80
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	51,6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	4,10E+05
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4	Guidance to check compliance with the Exposure Scenario

4.1. Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].

Section 1	**Exposure Scenario 9.3.1**
Title	**01a - Distribution of Substance**
Use Descriptor	Sector of Use: Industrial SU3
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15
Processes, tasks, activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
General exposures (Closed systems) CS15	Handle substance within a closed system E47
General exposures (Open systems) CS16	Wear suitable gloves tested to EN374 PPE15
Process sampling CS2	No other specific measures identified EI20
Laboratory activities CS36	No other specific measures identified EI20
Bulk closed loading and unloading CS501	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE15
Bulk open loading and unloading CS503	Wear suitable gloves tested to EN374 PPE15
Drum and small pack filling CS6	Wear suitable gloves tested to EN374 PPE15
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Handle substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*

Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*2,80E+07*
Fraction of Regional tonnage used locally	*0,002*
Annual site tonnage (tonnes/year)	*5,60E+04*
Maximum daily site tonnage (kg/day)	*1,90E+05*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*300*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1,00E-03*
Release fraction to wastewater from process (initial release prior to RMM)	*1,00E-06*
Release fraction to soil from process (initial release prior to RMM)	*1,00E-05*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	2,90E+06
Assumed domestic sewage treatment plant flow (m3/d)	2,00E+03
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4	**Guidance to check compliance with the Exposure Scenario**

4.1. Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].

Section 1	**Exposure Scenario 9.4.1**
Title	**02 - Formulation and (re-)packing of substances and mixtures**
Use Descriptor	Sector of Use: Industrial SU3, SU10
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15
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, pelletization, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
General exposures (closed systems) CS15	Handle substance within a closed system E47
General exposures (open systems) CS16	Wear suitable gloves tested to EN374 PPE15
Process sampling CS2	No other specific measures identified EI20
Drum and batch transfers CS8	Use drum pumps or carefully pour from container E64 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Bulk transfers CS14	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE15
Mixing operations (open systems) CS30	Provide extract ventilation to points where emissions occur E54 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Production or preparation or articles by tabletting, compression, extrusion or pelletisation CS100	Wear suitable gloves tested to EN374 PPE15

Drum and small package filling CS8	Wear suitable gloves tested to EN374 PPE15
Laboratory activities CS36	No other specific measures identified EI20
Equipment clean down and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*2,80E+07*
Fraction of Regional tonnage used locally	*0,0011*
Annual site tonnage (tonnes/year)	*3,00E+04*
Maximum daily site tonnage (kg/day)	*1,00E+05*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*300*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1,00E-02*
Release fraction to wastewater from process (initial release prior to RMM)	*2,00E-05*
Release fraction to soil from process (initial release prior to RMM)	*0,0001*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	59,9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	6,80E+05
Assumed domestic sewage treatment plant flow (m3/d)	2000

Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.5.1**
Title	**03a - Uses in Coatings : Industrial**
Use Descriptor	Sector of Use: Industrial SU3
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15
Processes, tasks, activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
General exposures (closed systems) CS15	Handle substance within a closed system E47
Bulk transfers CS14	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE15
Material transfers; Drum/batch transfers; Transfer from/pouring from containers CS3, CS8, CS22	Wear suitable gloves tested to EN374 PPE15
Preparation of material for application; Mixing operations (open systems) CS96, CS30	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16

Film formation - force drying, stoving and other technologies CS94	Handle substance within a closed system E47 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11.
Film formation - air drying CS95	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11.Wear suitable gloves tested to EN374 PPE15
Spraying (automatic/robotic) CS97	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60 Wear suitable gloves tested to EN374 PPE15.Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11
Manual spraying CS24	Wear a respirator conforming to EN140 with Type A filter or better. PPE22 Wear chemically resistant gloves (tested to type EN374) in combination with specific activity training PPE17 Ensure operatives are trained to minimise exposures EI19 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11
Roller, spreader, flow application. CS69	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17
Dipping, immersion and pouring. CS4	Wear suitable gloves tested to EN374 PPE15
Production of preparations or articles by tabletting, compression, extrusion, pelletisation CS100	No other specific measures identified EI20
Laboratory activities CS36	No other specific measures identified EI20
Equipment clean down and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Handle substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*8,10E+03*
Fraction of Regional tonnage used locally	*1*
Annual site tonnage (tonnes/year)	*8,10E+03*
Maximum daily site tonnage (kg/day)	*2,70E+04*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*300*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,98*
Release fraction to wastewater from process (initial release prior to RMM)	*7,00E-05*
Release fraction to soil from process (initial release prior to RMM)	*0*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	58,2

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1,40E+05
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.6.1**
Title	**03b - Uses in Coatings: Professional**
Use Descriptor	Sector of Use: Professional; SU22
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19
Processes, tasks, activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities.
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
General exposures (closed systems) CS15	Handle substance within a closed system E47
Filling / preparation of equipment from drums or containers CS45	Wear suitable gloves tested to EN374 PPE15
Material transfers, Pumped Drum/batch transfers CS3, CS8	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Preparation of material for application; Mixing operations (closed systems) CS96, CS29	No other specific measures identified EI20
Preparation of material for application, mixing operations (open systems) CS66,CS30	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16

Film formation - air drying CS95	Wear suitable gloves tested to EN374 PPE15
Manual spraying, indoor CS24, OC8	Carry out in a vented booth or extracted enclosure E57 Wear suitable gloves tested to EN374 PPE15 Limit the substance content in the product to 25 % OC18 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11
Manual spraying, outdoor CS24, OC9	Wear a half mask respirator conforming to EN140, 149 or equivalent PPE22 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17 Limit the substance content in the product to 25 % OC18 Avoid carrying out activities involving exposure for more than 4 hours OC28 Ensure operatives are trained to minimise exposures EI19
Roller, spreader, flow application CS69	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 Limit the substance content in the product to 25 % OC18
Dipping, immersion and pouring CS4	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
Hand application - fingerpaints, pastels, adhesives CS72	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17 Limit the substance content in the product to 5 % OC17
Laboratory activities CS36	No other specific measures identified EI20
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance E65 Wear chemically resistant gloves (tested to type EN374) in combination with basic employee training PPE16
Storage CS67	Store substance within a closed system E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*2,30E+03*
Fraction of Regional tonnage used locally	*5,00E-04*
Annual site tonnage (tonnes/year)	*1,20E+00*
Maximum daily site tonnage (kg/day)	*3,20E+00*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,98*
Release fraction to wastewater from process (initial release prior to RMM)	*0,01*
Release fraction to soil from process (initial release prior to RMM)	*0,01*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	941
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	5,00E+01
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.7.1**
Title	**05a - Uses in Oil and Gas Field Drilling and production Operations : Industrial**
Use Descriptor	Sector of Use: Industrial SU3
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
Processes, tasks, activities covered	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
Bulk transfers CS14	Transfer via enclosed lines E52
Filling / preparation of equipment from drums or containers. CS45	Wear suitable gloves tested to EN374 PPE15 .
Drilling mud (re-) formulation CS512	No other specific measures identified EI20
Drilling head operations CS513	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Shale shaker operations CS514	Provide the operation with a properly sited receiving hood E71.
Shale shaker operations, cleaning CS514, CS47	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Cuttings treatment and disposal CS515	Provide extract ventilation to points where emissions occur E54
Sample collection CS2	No other specific measures identified EI20
General exposures (closed systems) CS15	Handle substance within a closed system E47
General exposures (open systems) CS16	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Pouring from small containers CS9	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16

Equipment cleaning and maintenance CS39	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*1*
Regional use tonnage (tonnes/year)	*7,75E+03*
Fraction of Regional tonnage used locally	*Not applicable*
Annual site tonnage (tonnes/year)	*Not applicable*
Maximum daily site tonnage (kg/day)	*Not applicable*
Frequency and duration of use	
Emission days (days/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*
Technical conditions and measures at process level (source) 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	
Not applicable	
Treat air emission to provide a typical removal efficiency of (%)	Not applicable
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	Not applicable
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	Not applicable
Organisation measures to prevent/limit release from site	
Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	Not applicable
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 (m3/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 treatment and disposal of waste should comply with applicable local and/or national regulations.	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	

Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment. Qualitative approach used to conclude safe use.	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. 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. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Discharge to aquatic environment is restricted by law and industry prohibits release (OSPAR commission 2009). Discharges, Spills and Emmissions from Offshore Oil and Gas Installations in 2007, including the assessment of data reported in 2006 and 2007	

Section 1	**Exposure Scenario 9.8.1**
Title	**05b - Uses in Oil and Gas Field Drilling and production Operations : Professional**
Use Descriptor	Sector of Use: Professional; SU22
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b
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.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
Bulk transfers CS14	Wear suitable gloves tested to EN374 PPE15
Filling / preparation of equipment from drums or containers. CS45	Wear suitable gloves tested to EN374 PPE15
Drilling mud (re-) formulation CS512	No other specific measures identified EI20
Drilling head operations CS513	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Shale shaker operations CS514	Provide the operation with a properly sited receiving hood E71.
Shale shaker operations, cleaning CS514, CS47	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Cuttings treatment and disposal CS515	Provide extract ventilation to points where emissions occur E54
Sample collection CS2	No other specific measures identified EI20
General exposures (closed systems) CS15	Handle substance within a closed system E47
General exposures (open systems) CS16	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Pouring from small containers CS9	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16

Equipment cleaning and maintenance CS39	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*1*
Regional use tonnage (tonnes/year)	*7,75E+03*
Fraction of Regional tonnage used locally	*Not applicable*
Annual site tonnage (tonnes/year)	*Not applicable*
Maximum daily site tonnage (kg/day)	*Not applicable*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/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*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Not applicable	
Treat air emission to provide a typical removal efficiency of (%)	*Not applicable*
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	*Not applicable*
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	*Not applicable*
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	*Not applicable*
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 (m3/d)	*Not applicable*
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	

External treatment and disposal of waste should comply with applicable local and/or national regulations.
3.2. Environment
External treatment and disposal of waste should comply with applicable local and/or national regulations.

Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. 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. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Discharge to aquatic environment is restricted by law and industry prohibits release (OSPAR commission 2009). Discharges, Spills and Emmissions from Offshore Oil and Gas Installations in 2007, including the assessment of data reported in 2006 and 2007	

Section 1	**Exposure Scenario 9.9.1**
Title	**06a - Lubricants: Industrial**
Use Descriptor	Sector(s) of Use: Industrial: SU3
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18
Processes, tasks, activities covered	Covers the use of formulated lubricants in closed and open systems including material transfers, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
General exposures (Closed systems) CS15	Handle substance within a closed system E47.
General exposures (Open systems) CS16	Provide extract ventilation to points where emissions occur. E54
Bulk transfers CS14	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE15
Filling preparation of equipment from drums or containers CS45	Wear gloves tested to EN374 PPE15
Initial factory fill of equipment CS75	Wear suitable gloves tested to EN374 PPE15
Operation and lubrication of high energy open equipment CS17	Provide extract ventilation to points where emissions occur E54 Restrict area of openings to equipment E68
Manual roller application or brushing CS13	Wear suitable gloves tested to EN374 with specific employee training PPE17

Treatment of articles by dipping and pouring CS35	Wear chemically resistant gloves (tested to EN374) PPE15
Spraying CS10	Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings E60 Wear suitable gloves tested to EN374, coveralls and eye protection PPE23
Maintenance (of larger plant items) and machine set up CS77	Ensure material transfers are under containment or extract ventilation E66 Provide extract ventilation to emission points when contact with warm (>50^{o}C) lubricant is likely E67 Wear suitable gloves tested to EN374 PPE15
Maintenance of small items CS18	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Re-manufacture of reject articles CS19	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*2,70E+04*
Fraction of Regional tonnage used locally	*0,0036*
Annual site tonnage (tonnes/year)	*1,00E+02*
Maximum daily site tonnage (kg/day)	*5,00E+03*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*20*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*5,00E-03*
Release fraction to wastewater from process (initial release prior to RMM)	*3,00E-06*
Release fraction to soil from process (initial release prior to RMM)	*0,001*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	70
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	7,80E+04
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.10.1**
Title	**06b - Lubricants: Professional (Low environmental release)**
Use Descriptor	Sector(s) of Use: Professional: SU22
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC13, PROC17, PROC20
Processes, tasks, activities covered	Covers the use of formulated lubricants in closed and open systems including material transfers, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
General exposures (Closed systems) CS15	Handle substance within a closed system E47 PPE15
Operation of equipment containing engine oils and similar CS26	No other specific measures identified EI20
General exposures (Open systems) CS16	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) E40 Wear suitable gloves tested to EN374 PPE15
Bulk transfers CS14	Wear suitable gloves tested to EN374 PPE15 Avoid carrying out operation for more than 4 hours OC12
Filling preparation of equipment from drums or containers CS45; dedicated facility CS81	Use drum pumps or carefully pour from container E64 Wear suitable gloves tested to EN374 PPE15

Filling preparation of equipment from drums or containers CS45; non-dedicated facility CS82	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Operation and lubrication of high energy open equipment CS17 Indoor OC8	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11
Operation and lubrication of high energy open equipment CS17 Outdoor OC9	Ensure operation is undertaken outdoors E69 Avoid carrying out operation for more than 4 hours OC12 Limit the substance content in the product to 25 % OC18 Wear suitable gloves tested to EN374 PPE15 Ensure operatives are trained to minimise exposures EI19
Maintenance (of larger plant items) and machine set up CS77	Ensure material transfers are under containment or extract ventilation E66 Provide extract ventilation to emission points when contact with warm (>50^{o}C) lubricant is likely E67 Wear suitable gloves tested to EN374 PPE15
Maintenance of small items CS18	Drain or remove substance from equipment prior to break-in or maintenance E81 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Engine lubricant service CS78	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Manual roller application or brushing CS13	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. PPE17
Spraying CS10 with local exhaust ventilation CS109	Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings E60 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 Ensure operatives are trained to minimise exposures EI19
Spraying CS10 without local exhaust ventilation CS110	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. PPE32. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. PPE18 Limit the substance content in the product to 25 % OC18 Avoid carrying out activities involving exposure for more than 4 hours OC28
Treatment of articles by dipping and pouring CS35	Wear suitable gloves tested to EN374 PPE15
Storage CS67	Store substance within a closed system E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*3,20E+03*
Fraction of Regional tonnage used locally	*0,0005*
Annual site tonnage (tonnes/year)	*1,60E+00*
Maximum daily site tonnage (kg/day)	*4,40E+00*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,01*
Release fraction to wastewater from process (initial release prior to RMM)	*0,01*

Release fraction to soil from process (initial release prior to RMM)	*0,01*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	6,80E+01
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	

Section 1	**Exposure Scenario 9.10.1**
Title	**06c - Lubricants: Professional (High environmental release)**
Use Descriptor	Sector(s) of Use: Professional: SU22
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9,PROC13, PROC17, PROC20
Processes, tasks, activities covered	Covers the use of formulated lubricants in closed and open systems including material transfers, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.
Section 2	**Operational conditions and risk management measures**
Field for additional statements to explain scenario if required.	
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (carcinogens) G18	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
General exposures (Closed systems) CS15	Handle substance within a closed system E47 PPE15
Operation of equipment containing engine oils and similar CS26	No other specific measures identified EI20
General exposures (Open systems) CS16	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) E40 Wear suitable gloves tested to EN374 PPE15
Bulk transfers CS14	Wear suitable gloves tested to EN374 PPE15 Avoid carrying out operation for more than 4 hours OC12
Filling preparation of equipment from drums or containers CS45; dedicated facility CS81	Use drum pumps or carefully pour from container E64 Wear suitable gloves tested to EN374 PPE15

Filling preparation of equipment from drums or containers CS45; non-dedicated facility CS82	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Operation and lubrication of high energy open equipment CS17 Indoor OC8	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11
Operation and lubrication of high energy open equipment CS17 Outdoor OC9	Ensure operation is undertaken outdoors E69 Avoid carrying out operation for more than 4 hours OC12 Limit the substance content in the product to 25 % OC18 Wear suitable gloves tested to EN374 PPE15 Ensure operatives are trained to minimise exposures EI19
Maintenance (of larger plant items) and machine set up CS77	Ensure material transfers are under containment or extract ventilation E66 Provide extract ventilation to emission points when contact with warm (>50^{o}C) lubricant is likely E67 Wear suitable gloves tested to EN374 PPE15
Maintenance of small items CS18	Drain or remove substance from equipment prior to break-in or maintenance E81 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Engine lubricant service CS78	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Manual roller application or brushing CS13	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. PPE17
Spraying CS10	Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings E60 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 Ensure operatives are trained to minimise exposures EI19 If technical measures not practical: G16 Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. PPE32. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. PPE18 Limit the substance content in the product to 25 % OC18 Avoid carrying out activities involving exposure for more than 4 hours OC28
Treatment of articles by dipping and pouring CS35	Wear suitable gloves tested to EN374 PPE15
Storage CS67	Store substance within a closed system E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*3,20E+03*
Fraction of Regional tonnage used locally	*0,0005*
Annual site tonnage (tonnes/year)	*1,60E+00*
Maximum daily site tonnage (kg/day)	*4,40E+00*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1,5-1*
Release fraction to wastewater from process (initial release prior to RMM)	*0,05*

Release fraction to soil from process (initial release prior to RMM)	*0,05*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	6,80E+01
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].

Section 1	**Exposure Scenario 9.12.1**
Title	**07a - Use in Metal Working Fluids/Rolling Oils: Industrial**
Use Descriptor	Sector(s) of Use: Industrial: SU3
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17
Processes, tasks, activities covered	Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
General exposures (Closed systems) CS15	Handle substance within a closed system E47
General exposures (Open systems) CS16	Provide extract ventilation to points where emissions occur E54
Bulk transfers CS14	Handle substance within a closed system. E47 Wear gloves tested to EN374 PPE15
Filling preparation of equipment from drums or containers CS45	Wear gloves tested to EN374 PPE15
Process sampling CS2	No other specific measures identified EI20
Metal Machining Operations CS79	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60

Treatment of articles by dipping and pouring CS35	Wear gloves tested to EN374. PPE15
Spraying CS10	Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings. E60 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) . E11 Wear gloves tested to EN374, coveralls and eye protection PPE23
Manual roller application or brushing CS13	Wear suitable gloves tested to EN374 with specific employee training PPE17
Automated metal rolling/forming CS80	Handle substance within a predominantly closed system provided with extract ventilation E49
Semi-automated metal rolling/forming CS83	Provide extract ventilation to points where emissions occur E54.
Equipment cleaning and maintenance CS39.	Drain down system prior to equipment break-in or maintenance E55 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*1,00E+04*
Fraction of Regional tonnage used locally	*0,0097*
Annual site tonnage (tonnes/year)	*1,00E+02*
Maximum daily site tonnage (kg/day)	*5,00E+03*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*20*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,02*
Release fraction to wastewater from process (initial release prior to RMM)	*3,00E-06*
Release fraction to soil from process (initial release prior to RMM)	*0*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	70
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	

Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	7,80E+04
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 treatment and disposal of waste should comply with applicable local and/or national regulations.	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.13.1**
Title	**10a - Use as Release agents or Binders: Industrial**
Use Descriptor	Sector of Use: Industrial SU3
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14
Processes, tasks, activities covered	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
Bulk transfers CS14	Handle substance within a closed system E47
Drum and batch transfers CS8	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Mixing operations (closed systems) CS29	No other specific measures identified EI20
Mixing operations (open systems) CS30	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Mould forming CS31	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Casting Operations (open systems) CS32, CS108	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60 Wear suitable gloves tested to EN374 PPE15
Spraying (machine) CS10, CS33	Minimise exposure by extracted full enclosure for the operation or equipment E61 Wear suitable gloves tested to EN374 PPE15

Spraying (manual) CS10, CS34	Wear a full face respirator conforming to EN140 with Type A filter or better.PPE24 Wear suitable gloves (tested to EN374), coverall and eye protection. PPE23 Ensure operatives are trained to minimise exposures. EI19
Manual applications e.g. brushing, rolling CS13	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17
Equipment clean down and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Handle substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*1,40E+04*
Fraction of Regional tonnage used locally	*0,18*
Annual site tonnage (tonnes/year)	*2,50E+03*
Maximum daily site tonnage (kg/day)	*2,50E+04*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*100*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1*
Release fraction to wastewater from process (initial release prior to RMM)	*3,00E-07*
Release fraction to soil from process (initial release prior to RMM)	*0*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	80
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1

Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1,70E+05
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.14.1**
Title	**10b - Use as Release agents or Binders: Professional**
Use Descriptor	Sector of Use: Professional; SU22
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC6, PROC 8a, PROC8b, PROC10, PROC11, PROC14
Processes, tasks, activities covered	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
Bulk transfers (closed systems) CS3, CS107	No other specific measures identified EI20
Drum/batch transfers CS8	Wear suitable gloves tested to EN374 PPE15
Mixing operations (closed systems) CS29	No other specific measures identified EI20
Mixing operations (open systems) CS30	Wear suitable gloves tested to EN374 PPE15
Mould forming CS31	Provide extract ventilation to points where emissions occur E54 Wear suitable gloves tested to EN374 PPE15
Casting Operations, with local exhaust ventilation CS32, CS109	Provide extract ventilation to points where emissions occur E54 Wear suitable gloves tested to EN374 PPE15
Casting Operations, without local exhaust ventilation CS32, CS110	Wear a respirator conforming to EN140 with Type A filter or better. PPE22 Wear suitable gloves (tested to EN374), coverall and eye protection. PPE23

Spraying (manual) CS10, CS34 with local exhaust ventilation CS109	Apply ventilation or undertake in ventilated enclosure E57 Wear suitable gloves (tested to EN374), coverall and eye protection PPE23 Ensure operatives are trained to minimise exposures EI19
Spraying (manual) CS10, CS34 without local exhaust ventilation CS110	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. PPE32 Wear suitable gloves (tested to EN374), coverall and eye protection. PPE23 Ensure operatives are trained to minimise exposures. EI19
Manual applications e.g. brushing, rolling CS34, CS51	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance E65 Wear chemically resistant gloves (tested to type EN374) in combination with basic employee training PPE16
Storage CS67	Store substance within a closed system E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*2,90E+03*
Fraction of Regional tonnage used locally	*0,0005*
Annual site tonnage (tonnes/year)	*1,50E+00*
Maximum daily site tonnage (kg/day)	*4,00E+00*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,95*
Release fraction to wastewater from process (initial release prior to RMM)	*0,025*
Release fraction to soil from process (initial release prior to RMM)	*0,025*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion) [TCR1j].	
No wastewater treatment required [TCR9]	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	6,20E+01
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.15.1**
Title	**12a - Use as a Fuel: Industrial**
Use Descriptor	Sector of Use: Industrial SU3
	Process Categories: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
Bulk transfers CS14	Wear suitable gloves tested to EN374. PPE15
Drum/batch transfers CS8	Wear suitable gloves tested to EN374.PPE15
Use as a fuel (closed systems) GES16, CS107	No other specific measures identified EI20
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance E65 Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training PPE16
Cleaning fuel storage tanks CS103	Apply vessel entry procedures including use of forced supplied air. AP15 Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training PPE16
Storage CS67	Handle substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*4,50E+06*
Fraction of Regional tonnage used locally	*0,34*

Annual site tonnage (tonnes/year)	*1,50E+06*
Maximum daily site tonnage (kg/day)	*5,00E+06*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*300*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*5,00E-03*
Release fraction to wastewater from process (initial release prior to RMM)	*1,00E-05*
Release fraction to soil from process (initial release prior to RMM)	*0*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	95
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	97,7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	60,4
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97,7
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	5,00E+06
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**

4.1. Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].

Section 1	**Exposure Scenario 9.16.1**
Title	**12b - Use as a Fuel: Professional**
Use Descriptor	Sector of Use: Professional; SU22
	Process Categories: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
Bulk transfers CS14	Wear suitable gloves tested to EN374. PPE15
Drum/batch transfers CS8	Use drum pumps or carefully pour from container E64 Wear suitable gloves tested to EN374. PPE15
Refuelling activities CS507	Wear suitable gloves tested to EN374 PPE15
Use as a fuel (closed systems) GES16, CS107	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 **or** Ensure operation is undertaken outdoors E69
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance E65 Wear chemically resistant gloves (tested to EN374) in combination with basic employee training PPE16
Storage CS67	Store substance within a closed system E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*6,70E+06*
Fraction of Regional tonnage used locally	*0,0005*

Annual site tonnage (tonnes/year)	*3,30E+03*
Maximum daily site tonnage (kg/day)	*9,20E+03*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1,00E-04*
Release fraction to wastewater from process (initial release prior to RMM)	*1,00E-05*
Release fraction to soil from process (initial release prior to RMM)	*1,00E-05*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1,40E+05
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**

4.1. Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].

Section 1		**Exposure Scenario 9.16.1**
Title		**12c - Use as a Fuel: Consumer**
Use Descriptor		Sector of Use: Consumer; SU21
		Process Categories: PROC13
Processes, tasks, activities covered		Covers consumer uses in fuels.
Section 2		**Operational conditions and risk management measures**
Section 2.1		**Control of worker exposure**
Product characteristics		
Physical form of product		Liquid
Vapour pressure		Liquid, vapour pressure > 10 Pa OC15
Concentration of substance in product		Unless otherwise stated, covers concentrations up to 100% [ConsOC1]
Amounts used		*Not applicable*
Frequency and duration of use		Unless otherwise stated, covers use amount up to 37500g [ConsOC2]; covers skin contact area up to 420 cm² [ConsOC14]
Human factors not influenced by risk		*Not applicable*
Other Operational Conditions affecting worker exposure		Unless otherwise stated, covers use frequency up to 0.143 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC14]
Contributing Scenarios		**Specific Risk Management Measures and Operating Conditions**
PC13:Fuels--Liquid - subcategories added: Automotive Refueling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 37500g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 0.05hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid - subcategories added: Garden Equipment – Use	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
PC13:Fuels—Liquid - (subcategories added): Garden Equipment – Refueling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 420.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 750g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
Section 2.2		**Control of environmental exposure**
Product characteristics		*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used		
Fraction of EU tonnage used in region		*0,1*
Regional use tonnage (tonnes/year)		*1,60E+07*
Fraction of Regional tonnage used locally		*0,0005*
Annual site tonnage (tonnes/year)		*8,20E+03*
Maximum daily site tonnage (kg/day)		*2,30E+04*
Frequency and duration of use		
Continuous release [FD2].		
Emission days (days/year)		*365*
Environmental factors not influenced by risk management		
Local freshwater dilution factor		*10*
Local marine water dilution factor		*100*

Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*1,00E-04*
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*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	3,50E+05
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 [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC Report #107 and the Chapter R15 of IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.18.1**
Title	**13a - Use as a functional fluids: Industrial**
Use Descriptor	Sector of Use: Industrial SU3
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC 8a, PROC 8b, PROC9
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
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3
Bulk transfers CS14	No other specific measures identified EI20
Drum/batch transfers CS8	Wear suitable gloves tested to EN374 PPE15
Filling of articles/equipment (closed systems) CS84, CS107	Transfer via enclosed lines E52
Filling / preparation of equipment from drums or containers CS45	Wear suitable gloves tested to EN374 PPE15
Equipment operation (closed systems) CS15	No other specific measures identified EI20
Equipment operation (open systems) CS16	Restrict area of openings and provide extract ventilation to emission points when substance handled at elevated temperatures E75
Re-work and re-manufacture of articles CS19	Wear suitable gloves tested to EN374 PPE15
Equipment cleaning and maintenance CS39	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*

Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*6,40E+03*
Fraction of Regional tonnage used locally	*0,0016*
Annual site tonnage (tonnes/year)	*1,00E+01*
Maximum daily site tonnage (kg/day)	*5,00E+02*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*20*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*5,00E-03*
Release fraction to wastewater from process (initial release prior to RMM)	*3,00E-06*
Release fraction to soil from process (initial release prior to RMM)	*0,001*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	7,80E+03
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4	**Guidance to check compliance with the Exposure Scenario**

4.1. Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].

Section 1	**Exposure Scenario 9.19.1**
Title	**15 - Use in road and construction applications: Professional**
Use Descriptor	Sector of Use: Professional; SU22
	Process Categories: PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13
Processes, tasks, activities covered	Application of surface coatings and binders in road and construction activities, including paving uses, manual mastic and in the application of roofing and water-proofing membranes
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
Drum/batch transfers (Non-dedicated facility) CS8, CS82	Wear gloves tested to EN374 PPE15
Drum/batch transfers (dedicated facility) CS8, CS81	Wear gloves tested to EN374 PPE15
Spraying/fogging by machine application CS25	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60 Ensure operation is undertaken outdoors E69 Wear gloves tested to EN374 PPE15
Manual applications e.g. brushing, rolling CS13	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17
Dipping, immersion and pouring CS4	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65.Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16

Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*3,10E+04*
Fraction of Regional tonnage used locally	*5,00E-04*
Annual site tonnage (tonnes/year)	*1,10E+05*
Maximum daily site tonnage (kg/day)	*4,20E+01*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,95*
Release fraction to wastewater from process (initial release prior to RMM)	*0,01*
Release fraction to soil from process (initial release prior to RMM)	*0,04*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	12,2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	6,20E+02
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	

Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.19.1**
Title	**18b - Explosives Manufacture & Use : Professional**
Use Descriptor	Sector of Use: Professional; SU22
	Process Categories: PROC1, PROC3, PROC5, PROC8a, PROC8b,
Processes, tasks, activities covered	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently G15 Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop. E3
General measures (closed systems) CS15	Handle substance within a closed system E47
General measures (open systems) CS16	Wear gloves tested to EN374 PPE15
Process sampling CS2	No specific measures identified EI18
Drum/batch transfers CS8	Use drum pumps or carefully pour from container E64 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Bulk transfers CS14	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE15
Mixing operations (open systems) CS30	Provide extract ventilation to points where emissions occur E54 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Production or preparation or articles by tabletting, compression, extrusion or pelletisation CS100	Wear suitable gloves tested to EN374 PPE15
Drum and small package filling CS8	Wear suitable gloves tested to EN374 PPE15
Laboratory activities CS36	No specific measures identified EI18

Equipment cleaning and maintenance CS39	Drain down system prior to equipment break-in or maintenance. E65.Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*1,30E+04*
Fraction of Regional tonnage used locally	*5,00E-04*
Annual site tonnage (tonnes/year)	*6,70E+00*
Maximum daily site tonnage (kg/day)	*1,80E+01*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*365*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,001*
Release fraction to wastewater from process (initial release prior to RMM)	*0,02*
Release fraction to soil from process (initial release prior to RMM)	*0,01*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	8,8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	2,90E+02
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	

Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	

Section 1	**Exposure Scenario 9.21.1**
Title	**19 - Rubber production and processing: Industrial**
Use Descriptor	Sector of Use: Industrial SU3, SU10, SU11
	Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15,
Processes, tasks, activities covered	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, calendaring, vulcanising, cooling and finishing as well as maintenance.
Section 2	**Operational conditions and risk management measures**
Section 2.1	**Control of worker exposure**
Product characteristics	
Physical form of product	Liquid
Vapour pressure	Liquid, vapour pressure < 0.5 kPa at STP. OC3
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amounts used	*Not applicable*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	*Not applicable*
Other Operational Conditions affecting worker exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures applicable to all activities CS135	Control any potential exposure using measures such as contained systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and 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 exposure potential and aware of basic actions to minimse 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; provide regular health surveillance as appropriate; identify and implement corrective actions. G25
General measures (skin irritants) G19	Avoid all skin contact with product, clean up contamination/spills as soon as they occur. Wear gloves (tested to EN374) if hand contamination likely, wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. E3 Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. E4
Bulk transfers (closed systems) CS14, CS107	No other specific measures identified EI20
Bulk transfers (open systems) CS14, CS108	Wear suitable gloves tested to EN374 PPE15
Material transfers CS3	Wear suitable gloves tested to EN374. PPE15
Bulk weighing CS91	Wear suitable gloves tested to EN374.PPE15 No other specific measures identified EI20
Small scale weighing CS90	Wear suitable gloves tested to EN374 PPE15
Additive pre-mixing CS92	Wear suitable gloves tested to EN374.PPE15
Calendaring (including Banburys) CS64	Handle substance within a predominantly closed system provided with extract ventilation E49 Wear suitable gloves tested to EN374 PPE15
Pressing uncured rubber blanks CS73	Wear suitable gloves tested to EN374 PPE15

Tyre build-up CS112	Minimise exposure by extracted full enclosure for the operation or equipment E61 Wear suitable gloves (tested to EN374), coverall and eye protection PPE23
Vulcanisation CS70	Provide extract ventilation to material transfer points and other openings E82
Cooling cured articles CS71	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings E60
Production of articles by dipping and pouring CS113	Wear suitable gloves tested to EN374 PPE15
Finishing operations CS102	Wear suitable gloves tested to EN374 PPE15
Laboratory activities CS36	No other specific measures identified EI20
Equipment clean down and maintenance CS39	Drain or remove substance from equipment prior to break-in or maintenance E81 Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training PPE16
Storage CS67	Store substance within a closed system. E84
Section 2.2	**Control of environmental exposure**
Product characteristics	*Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].*
Amounts used	
Fraction of EU tonnage used in region	*0,1*
Regional use tonnage (tonnes/year)	*1,60E+04*
Fraction of Regional tonnage used locally	*1*
Annual site tonnage (tonnes/year)	*1,60E+04*
Maximum daily site tonnage (kg/day)	*5,20E+04*
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	*300*
Environmental factors not influenced by risk management	
Local freshwater dilution factor	*10*
Local marine water dilution factor	*100*
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	*0,01*
Release fraction to wastewater from process (initial release prior to RMM)	*3,00E-05*
Release fraction to soil from process (initial release prior to RMM)	*1,00E-04*
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to providethe required removal efficiency ≥ (%)	52,8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	

Estimated substance removal from wastewater via domestic sewage treatment (%)	94,1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94,1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	4,20E+05
Assumed domestic sewage treatment plant flow (m3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated to treat [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated to recover [ERW2].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in PETRORISK file in IUCLID Section 13.	
Section 3	**Exposure Estimation**
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – “Site-Specific Production” worksheet [DSU6].	