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

1.1. Product identifier

Product form : Substance
Trade name/designation : Kerosine
EC Index : 649-404-00-4
EC-No. : 232-366-4
CAS-No. : 8008-20-6
REACH registration No. : 01-2119485517-27-0133
Product group : Trade product

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

1.2.1. Relevant identified uses

Intended for general public
Main use category : Industrial use,Professional use,Consumer use
Use of the substance/mixture : Fuels
see attached exposure scenario.

Title	Use descriptors
Use as an intermediate (ES Ref.: 01b)	SU8, SU9, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Distribution of substance (ES Ref.: 01a)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Uses in coatings (ES Ref.: 05)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15, ERC4, ESVOC SPERC 4.3a.v1
Industrial use in cleaning agents : Not applicable EC 265-198-5) (ES Ref.: 04a)	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13, ERC4, ESVOC SPERC 4.4a.v1
Lubricants (ES Ref.: 11)	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, ERC4, ERC7, ESVOC SPERC 4.6a.v1
Metal working fluids / rolling oils (ES Ref.: 16)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, ERC4, ESVOC SPERC 4.7a.v1
Use as binders and release agents (ES Ref.: 18)	PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14, ERC4, ESVOC SPERC 4.10a.v1
Use as a fuel in industrial settings (ES Ref.: 12a)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC7, ESVOC SPERC 7.12a.v1
Functional fluids (ES Ref.: 25)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, ERC7, ESVOC SPERC 7.13a.v1
Uses in coatings (ES Ref.: 06)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19, ERC8a, ERC8d, ESVOC SPERC 8.3b.v1
Professional use in cleaning agents (ES Ref.: 09)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13, ERC8a, ERC8d, ESVOC SPERC 8.4b.v1
Lubricants: Low environmental release (ES Ref.: 12)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20, ERC9a, ERC9b, ESVOC SPERC 9.6b.v1
Lubricants: High environmental release (ES Ref.: 13)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20, ERC8a, ERC8d, ESVOC SPERC 8.6c.v1
Metal working fluids / rolling oils (ES Ref.: 17)	PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, ERC8a, ERC8d, ESVOC SPERC 8.7c.v1
Use as binders and release agents (ES Ref.: 19)	PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14, ERC8a, ERC8d, ESVOC SPERC 8.10b.v1
Use in agrochemicals	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13, ERC8a,

(ES Ref.: 20)	ERC8d, ESVOC SPERC 8.11a.v1
Road and construction applications (ES Ref.: 26)	PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, ERC8d, ERC8f, ESVOC SPERC 8.15.v1
Explosives manufacture & use (ES Ref.: 27)	PROC1, PROC3, PROC5, PROC8a, PROC8b, ERC8e
Uses in coatings (ES Ref.: 06)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19, ERC8a, ERC8d, ESVOC SPERC 8.3b.v1
Professional use in cleaning agents (ES Ref.: 09)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13, ERC8a, ERC8d, ESVOC SPERC 8.4b.v1
Lubricants: Low environmental release (ES Ref.: 12)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20, ERC9a, ERC9b, ESVOC SPERC 9.6b.v1
Lubricants: High environmental release (ES Ref.: 13)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20, ERC8a, ERC8d, ESVOC SPERC 8.6c.v1
Metal working fluids / rolling oils (ES Ref.: 17)	PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, ERC8a, ERC8d, ESVOC SPERC 8.7c.v1
Use as binders and release agents (ES Ref.: 19)	PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14, ERC8a, ERC8d, ESVOC SPERC 8.10b.v1
Use in agrochemicals (ES Ref.: 20)	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13, ERC8a, ERC8d, ESVOC SPERC 8.11a.v1
Use as a fuel in professional settings (ES Ref.: 12b)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Road and construction applications (ES Ref.: 26)	PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, ERC8d, ERC8f, ESVOC SPERC 8.15.v1
Explosives manufacture & use (ES Ref.: 27)	PROC1, PROC3, PROC5, PROC8a, PROC8b, ERC8e
Uses in coatings (ES Ref.: 07)	PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34, ERC8a, ERC8d, ESVOC SPERC 8.3c.v1
Use in cleaning agents (ES Ref.: 10)	PC3, PC4, PC8, PC9a, PC24, PC35, PC38, ERC8a, ERC8d, ESVOC SPERC 8.4c.v1
Lubricants: Low environmental release (ES Ref.: 14)	PC1, PC24, PC31, ERC9a, ERC9b, ESVOC SPERC 9.6d.v1
Lubricants: High environmental release (ES Ref.: 15)	PC1, PC24, PC31, ERC8a, ERC8d, ESVOC SPERC 8.6e.v1
Use in agrochemicals (ES Ref.: 21)	PC12, PC27, ERC8a, ERC8d, ESVOC SPERC 8.11b.v1
Uses in coatings (ES Ref.: 07)	PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34, ERC8a, ERC8d, ESVOC SPERC 8.3c.v1
Use in cleaning agents (ES Ref.: 10)	PC3, PC4, PC8, PC9a, PC24, PC35, PC38, ERC8a, ERC8d, ESVOC SPERC 8.4c.v1
Lubricants: Low environmental release (ES Ref.: 14)	PC1, PC24, PC31, ERC9a, ERC9b, ESVOC SPERC 9.6d.v1
Lubricants: High environmental release (ES Ref.: 15)	PC1, PC24, PC31, ERC8a, ERC8d, ESVOC SPERC 8.6e.v1
Use in agrochemicals (ES Ref.: 21)	PC12, PC27, ERC8a, ERC8d, ESVOC SPERC 8.11b.v1
Use as a fuel (ES Ref.: 12c)	PC13, ERC9a, ERC9b, ESVOC SPERC 9.12c.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 02)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, ERC2, ESVOC SPERC 2.2.v1

Full text of use descriptors: see section 16

1.2.2. Uses advised against

Title	Use descriptors	Reason
Uses in coatings	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19, ERC8a, ERC8d	
Uses in coatings: Professional uses	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19, ERC8a, ERC8d	General protective and hygienic measures
Use in cleaning agents: Professional uses	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13, ERC8a, ERC8d	General protective and hygienic measures
Lubricants: Professional uses (Low environmental release)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20, ERC9a, ERC9b	General protective and hygienic measures
Lubricants: Professional uses (High environmental release)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20, ERC8a, ERC8d	General protective and hygienic measures
Metal working fluids / rolling oils: Professional uses	PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, ERC8a, ERC8d	General protective and hygienic measures
Use as binders and release agents: Professional uses	PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14, ERC8a, ERC8d	General protective and hygienic measures
Use in agrochemicals: Professional uses	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13, ERC8a, ERC8d	General protective and hygienic measures
Road and construction applications: Professional uses	PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, ERC8d, ERC8f	General protective and hygienic measures
Explosives manufacture & use: Professional uses	PROC1, PROC3, PROC5, PROC8a, PROC8b, ERC8e	General protective and hygienic measures
Uses in coatings: Consumer uses	PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC23, PC24, PC24, PC31, PC34, PC34, ERC8a, ERC8d	General protective and hygienic measures
Use in cleaning agents: Consumer uses	PC0, PC3, PC4, PC8, PC9a, PC24, PC35, PC38, ERC8a, ERC8d	General protective and hygienic measures
Lubricants: Consumer uses (Low environmental release)	PC1, PC24, PC31, ERC9a, ERC9b	General protective and hygienic measures
Lubricants: Consumer uses (High environmental release)	PC1, PC24, PC31, ERC8a, ERC8d	General protective and hygienic measures
Use in agrochemicals: Consumer uses	PC12, PC27, ERC8a, ERC8d	General protective and hygienic measures

Full text of use descriptors: see section 16

1.3. Details of the supplier of the safety data sheet

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

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

1.4. Emergency telephone number

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

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

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flammable liquids, Category 3	H226
Skin corrosion/irritation, Category 2	H315
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment – Chronic Hazard, Category 2	H411
Specific target organ toxicity – Single exposure, Category 3, Narcosis	H336

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

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS02 GHS08 GHS07 GHS09

Signal word : Danger
Hazard statements (CLP) : H226 - Flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H336 - May cause drowsiness or dizziness.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP)	:	P101 - If medical advice is needed, have product container or label at hand. P102 - Keep out of reach of children. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P271 - Use only outdoors or in a well-ventilated area. P273 - Avoid release to the environment. P280 - Wear protective gloves, protective clothing, eye protection, face protection. P301+P310+P331 - IF SWALLOWED: Immediately call a POISON CENTER, a doctor. Do NOT induce vomiting. P391 - Collect spillage. P403+P235 - Store in a well-ventilated place. Keep cool. P405 - Store locked up. P501 - Dispose of contents and container to an approved waste disposal plant.
Listed on CLP Annex VI	:	EC Index-No.: 649-404-00-4
Child-resistant fastening	:	Applicable
Tactile warning	:	Applicable

2.3. Other hazards

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

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

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name	:	Kerosine (petroleum)
CAS-No.	:	8008-20-6
EC-No.	:	232-366-4
EC Index	:	649-404-00-4

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Kerosine (petroleum)	CAS-No.: 8008-20-6 EC-No.: 232-366-4 EC Index: 649-404-00-4 REACH-no: 01-2119485517-27-0133	100	Flam. Liq. 3, H226 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

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

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

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

Inhalation : Remove casualty to fresh air and keep warm and at rest. Give oxygen or artificial respiration if necessary. In case of doubt or persistent symptoms, consult always a physician.

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

Eyes contact : Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. In case of doubt or persistent symptoms, consult always a physician.

Ingestion : Rinse mouth thoroughly with water. Do NOT induce vomiting. Get immediate medical advice/attention.

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

Inhalation : May cause drowsiness or dizziness. The following symptoms may occur: May cause respiratory irritation. Cough.

Skin contact : Causes skin irritation. The following symptoms may occur: erythema (redness).

Eyes contact : Contact with eyes may cause irritation. The following symptoms may occur: erythema (redness).

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

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : carbon dioxide (CO2), powder, alcohol-resistant foam, water spray.

Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Flammable liquid and vapour. Vapours may form explosive mixture with air. Vapours are heavier than air and may spread along floors. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Heating will cause a rise in pressure with a risk of bursting.

Hazardous decomposition products in case of fire : Carbon oxides (CO, CO2). Sulphur oxides. sulphuric acid. Hydrogen sulfide.

5.3. Advice for firefighters

Firefighting instructions	:	Evacuate area. Use water spray or fog for cooling exposed containers. Contain the extinguishing fluids by bunding. Prevent fire fighting water from entering the environment.
Protection during firefighting	:	Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus.
Other information	:	Do not allow run-off from fire-fighting to enter drains or water courses. Dispose of waste in accordance with environmental legislation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel	:	Evacuate unnecessary personnel. Keep upwind. Provide adequate ventilation. Do not breathe vapours. Avoid contact with skin, eyes and clothing. Wear recommended personal protective equipment. Concerning personal protective equipment to use, see section 8. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ensure equipment is adequately earthed. Use explosion-proof equipment. Use only non-sparking tools.

6.1.2. For emergency responders

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

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

6.4. Reference to other sections

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Do not breathe vapours. Avoid contact with skin, eyes and clothing. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Take any precaution to avoid mixing with Incompatible materials, Refer to Section 10 on Incompatible Materials. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Avoid release to the environment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use explosion-proof equipment. Use only non-sparking tools. 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 : Keep good industrial hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feedingstuffs. Remove contaminated clothes. Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Keep out of reach of children.

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

Incompatible materials : Oxidising substances.

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

Special rules on packaging : Child-resistant fastening. Tactile warning (EN/ISO 11683). Containers which are opened should be properly resealed and kept upright to prevent leakage. Keep in properly labelled containers.

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

Germany

German storage class (LGK) : LGK 3 - Flammable liquids

Switzerland

Storage class (LK) : LK 3 - Flammable liquids

7.3. Specific end use(s)

see attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

Kerosine (petroleum) (8008-20-6)	
Belgium - Occupational Exposure Limits	
OEL TWA	200 mg/m³ (application limited to exposure conditions to negligible aerosols-total hydrocarbon vapor)
OEL chemical category	Skin
Bulgaria - Occupational Exposure Limits	
OEL TWA	300 mg/m³
Ireland - Occupational Exposure Limits	
OEL chemical category	Potential for cutaneous absorption
Poland - Occupational Exposure Limits	
NDS (OEL TWA)	100 mg/m³
NDSCh (OEL STEL)	300 mg/m³
Portugal - Occupational Exposure Limits	
OEL TWA	200 ppm (restricted to conditions in which there are negligible aerosol exposures)
OEL chemical category	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans, skin - potential for cutaneous exposure
Spain - Occupational Exposure Limits	
VLA-ED (OEL TWA)	200 mg/m³ (aviation fuel)
OEL chemical category	skin - potential for cutaneous absorption
Switzerland - Occupational Exposure Limits	
MAK (OEL TWA)	350 mg/m³ (vapour) 5 mg/m³ (aerosol, inhalable dust)
	50 ppm (vapour)
KZGW (OEL STEL)	20 mg/m³ (aerosol, inhalable dust) 700 mg/m³ (vapour)
	100 ppm (vapour)
USA - ACGIH - Occupational Exposure Limits	
ACGIH® TLV® TWA	200 mg/m³ (application restricted to conditions in which there are negligible aerosol exposures-total Hydrocarbon vapor (Kerosene/Jet fuels)
ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans, Skin - potential significant contribution to overall exposure by the cutaneous route

8.1.2. Recommended monitoring procedures

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

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

Kerosine (8008-20-6)	
DNEL/DMEL (general population)	
Long-term - systemic effects,oral	19 mg/kg bodyweight/day

Additional information : Recommended monitoring procedures :. Personal monitoring. Concentration measurement in air. Personal air monitoring. Room air monitoring

8.1.5. Control banding

No additional information available

8.2. Exposure controls

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

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

Hand protection : Wear chemically resistant gloves (tested to EN374) . Suitable material: rubber gloves, NBR (Nitrile rubber). Breakthrough time : refer to the recommendations of the supplier. Thickness of the glove material: Not determined. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.

Eye protection : Use suitable eye protection (EN166): Safety glasses. goggles

Body protection : Wear suitable protective clothing. Overalls, apron and boots recommended. (EN 11612, EN 1149)

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment. Half-face mask (DIN EN 140). full face mask (DIN EN 136). Filter type: AP (EN 14387). Use self-contained respiratory apparatus for rescue and maintenance work in storage vessels. (EN 137). The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, self-contained breathing apparatus must be used. (EN 137)

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

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

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: clear.
Appearance	: Liquid.
Odour	: petroleum hydrocarbon odour.
Odour threshold	: No data available
Melting / freezing point	: Not applicable (UVCB)
Freezing point	: Not available
Initial boiling point and boiling range	: 90 – 300 °C
Flammability	: Flammable liquid and vapour.
Explosive properties	: Not applicable. The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	: Not applicable. The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.
Lower explosion limit	: Not available
Upper explosion limit	: Not available
Flash point	: > 38 °C
Auto-ignition temperature	: > 220 °C
Decomposition temperature	: No data available
pH	: Not applicable
Kinematic viscosity	: 1 – 25 mm^2/s (40 °C) ; < 8,000 mm^2/s (-20°C)
Dynamic viscosity	: No data available
Solubility	: Water: Not applicable (UVCB)
Partition coefficient n-octanol/water (Log Kow)	: Not applicable (UVCB)
Vapour pressure	: 1 – 21 kPa (37.8°C)
Vapour pressure at 50°C	: Not available
Density	: 0,75 – 0,86 g/cm^3 (15°C)
Relative density	: No data available
Vapour density	: No data available
Particle characteristics	: Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

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

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect from sunlight. See Section 7 for information on safe handling.

10.5. Incompatible materials

oxidising substances. See Section 7 for information on safe handling.

10.6. Hazardous decomposition products

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

SECTION 11: Toxicological information

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

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

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

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

Kerosine (petroleum) (8008-20-6)	
LD50/oral/rat	> 5000 mg/kg OECD Test Guideline 401
LD50/dermal/rabbit	> 2000 mg/kg OECD 434
LC50/inhalation/4h/rat	> 5,28 mg/l/4h
LC50 Inhalation - Rat (Vapours)	> 5,28 mg/l/4h OECD Test Guideline 403

Skin corrosion/irritation : Causes skin irritation.
pH: Not applicable

Additional information : OECD Test Guideline 404

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

Additional information : Draize Test

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

Additional information : OECD Test Guideline 406

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

Additional information : Test Method OECD 475, 478, 479

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

Additional information : OECD Test Guideline 451

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

Additional information : OECD 421
OECD 422

STOT-single exposure : May cause drowsiness or dizziness.

Kerosine (petroleum) (8008-20-6)	
STOT-single exposure	May cause drowsiness or dizziness.

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

Kerosine (petroleum) (8008-20-6)	
NOAEL (oral, rat, 90 days)	750 mg/kg bodyweight/day
NOAEC, Inhalation	≥ 24 mg/m³ (28 days)
NOAEL, Dermal	≥ 400 mg/kg bw/day (28 days)
NOAEL, Inhalation	≥ 1000 mg/m³ (90 days)
NOAEL, Inhalation	750 mg/kg bw/day (90 days)

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

Kerosine (8008-20-6)	
Kinematic viscosity	1 – 25 mm²/s (40 °C) ; < 8,000 mm²/s (-20°C)

Kerosine (petroleum) (8008-20-6)	
Kinematic viscosity	1 – 2,5 mm²/s (40 °C)

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

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

11.2.2. Other information

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

SECTION 12: Ecological information

12.1. Toxicity

Environmental properties : Toxic to aquatic life with long lasting effects.

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

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

Kerosine (petroleum) (8008-20-6)	
LC50 - Fish [1]	2 – 5 mg/l (OECD test Guideline 203)
EC50 - Crustacea [1]	1,4 mg/l (OECD test guideline 202)
ErC50 algae	1 – 3 mg/l (OECD test guideline 201)
NOEC (chronic)	daphnia 0,48 mg/l (NOEL)
NOEC chronic fish	0,098 mg/l (NOEL)
NOEC chronic crustacea	0,48 mg/l

12.2. Persistence and degradability

Kerosine (8008-20-6)	
Persistence and degradability	Not applicable. Substance of unknown or variable composition, complex reaction products or biological material (UVCB).

12.3. Bioaccumulative potential

Kerosine (8008-20-6)	
Partition coefficient n-octanol/water (Log Kow)	Not applicable (UVCB)
Bioaccumulative potential	No additional information available.

Kerosine (petroleum) (8008-20-6)	
Partition coefficient n-octanol/water	study scientifically unjustified
Bioaccumulative potential	Substance is complex UVCB.

12.4. Mobility in soil

Kerosine (8008-20-6)	
Mobility in soil	No data available
Surface tension	Not applicable
Ecology - soil	No data available.

Kerosine (petroleum) (8008-20-6)	
Surface tension	not relevant

12.5. Results of PBT and vPvB assessment

Kerosine (8008-20-6)	
Results of PBT assessment	This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Endocrine disrupting properties

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

12.7. Other adverse effects

Other adverse effects : No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

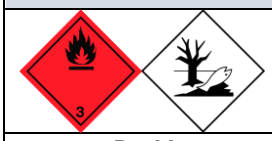
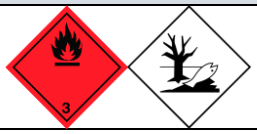
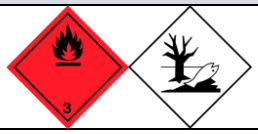
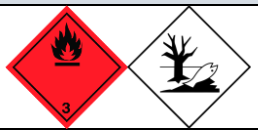
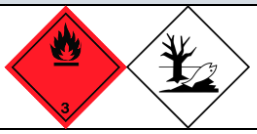
Product/Packaging disposal recommendations : Avoid release to the environment. Dispose of empty containers and wastes safely. See Section 7 for information on safe handling. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration. If recycling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

European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC) : This material and its container must be disposed of as hazardous waste
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities
The following Waste Codes are only suggestions:
13 07 03* - other fuels (including mixtures)
15 01 10* - packaging containing residues of or contaminated by dangerous substances .

SECTION 14: Transport information

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

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
1223	1223	1223	1223	1223
14.2. UN proper shipping name				
KEROSENE	KEROSENE	Kerosene	KEROSENE	KEROSENE
Transport document description				
UN 1223 KEROSENE, 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 1223 KEROSENE, 3, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1223 Kerosene, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 1223 KEROSENE, 3, III, ENVIRONMENTALLY HAZARDOUS	UN 1223 KEROSENE, 3, III, ENVIRONMENTALLY HAZARDOUS
14.3. Transport hazard class(es)				
3	3	3	3	3

ADR	IMDG	IATA	ADN	RID
				
14.4. Packing group				
III	III	III	III	III
14.5. Environmental hazards				
Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes
ADN : N2				

14.6. Special precautions for user

Special precautions for user : No data available

- Overland transport

Classification code (ADR)	:	F1
Special provisions	:	664
Limited quantities (ADR)	:	5l
Excepted quantities (ADR)	:	E1
Packing instructions (ADR)	:	P001, IBC03, LP01, R001
Mixed packing provisions (ADR)	:	MP19
Portable tank and bulk container instructions (ADR)	:	T2
Portable tank and bulk container special provisions (ADR)	:	TP2
Tank code (ADR)	:	LGBF
Vehicle for tank carriage	:	FL
Transport category (ADR)	:	3
Special provisions for carriage - Packages (ADR)	:	V12
Special provisions for carriage - Operation (ADR)	:	S2
Hazard identification number (Kemler No.)	:	30
Orange plates	:	30 1223
Tunnel restriction code	:	D/E
EAC code	:	3Y

- Transport by sea

Special provisions (IMDG)	:	363
Limited quantities (IMDG)	:	5 L
Excepted quantities (IMDG)	:	E1
Packing instructions (IMDG)	:	P001, LP01
IBC packing instructions (IMDG)	:	IBC03
Tank instructions (IMDG)	:	T2

Tank special provisions (IMDG)	: TP2
EmS-No. (Fire)	: F-E
EmS-No. (Spillage)	: S-E
Stowage category (IMDG)	: A
Properties and observations (IMDG)	: Immiscible with water.

- Air transport

PCA Excepted quantities (IATA)	: E1
PCA Limited quantities (IATA)	: Y344
PCA limited quantity max net quantity (IATA)	: 10L
PCA packing instructions (IATA)	: 355
PCA max net quantity (IATA)	: 60L
CAO packing instructions (IATA)	: 366
CAO max net quantity (IATA)	: 220L
Special provisions (IATA)	: A324
ERG code (IATA)	: 3L

- Inland waterway transport

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

- Rail transport

Classification code (RID)	: F1
Excepted quantities (RID)	: E1
Packing instructions (RID)	: P001, IBC03, LP01, R001
Mixed packing provisions (RID)	: MP19
Portable tank and bulk container instructions (RID)	: T2
Portable tank and bulk container special provisions (RID)	: TP2
Tank codes for RID tanks (RID)	: LGBF
Transport category (RID)	: 3
Special provisions for carriage – Packages (RID)	: W12
Colis express (express parcels) (RID)	: CE4
Hazard identification number (RID)	: 30

14.7. Maritime transport in bulk according to IMO instruments

Code: IBC : No data available.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)		
Reference code	**Applicable on**	**Entry title or description**
3(a)	Kerosine ; Kerosine (petroleum)	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F
3(b)	Kerosine ; Kerosine (petroleum)	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10
3(c)	Kerosine ; Kerosine (petroleum)	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1
40.	Kerosine ; Kerosine (petroleum)	Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.

REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

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

PIC Regulation (Prior Informed Consent)

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

POP Regulation (Persistent Organic Pollutants)

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

Ozone Regulation (2024/590)

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

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

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

Explosives Precursors Regulation (EU 2019/1148)

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

Drug Precursors Regulation (EC 273/2004)

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

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

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

15.1.2. National regulations

France

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

Germany

Risk classification according to VbF : A II - Liquids with a flashpoint between 21°C and 55°C.
Water hazard class (WGK) : WGK 2, Significantly hazardous to water.
Major Accidents Ordinance (12. BImSchV) : Listed in the 12. BImSchV (Annex I) under: 2.3.2
- Quantity threshold for operational area under § 1 para. 1
  - Sentence 1 :2500000 kg
  - Sentence 2 :25000000 kg

Netherlands

Waterbezwaarlijkheid	:	A (2) - Vergiftig voor in water levende organismen kan in het aquatische milieu op lange termijn schadelijke effecten veroorzaken
SZW-lijst van kankerverwekkende stoffen	:	The substance is not listed
SZW-lijst van mutagene stoffen	:	The substance is not listed
SZW-lijst van reprotoxische stoffen – Borstvoeding	:	The substance is not listed
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid	:	The substance is not listed
SZW-lijst van reprotoxische stoffen – Ontwikkeling	:	The substance is not listed

Denmark

Classification remarks	:	Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations	:	Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:

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

Abbreviations and acronyms:

	DNEL = Derived No Effect Level
	Derived Minimal Effect level
	Predicted No Effect Concentration
	Occupational Exposure Limits - Short Term Exposure Limits (STELs)
	time weighted average
	Median lethal concentration
	Median lethal dose
	Median lethal level
	EC50 = Median Effective Concentration
	EL50 = Median effective level
	ErC50 = EC50 in terms of reduction of growth rate
	ErL50 = EL50 in terms of reduction of growth rate
	no-observed-effect level
	NOEC = No observed effect concentration
	NOELR = No observed effect loading rate
	NOAEC = No observed adverse effect concentration
	NOAEL = No observed adverse effect level
	European waste catalogue
	Not applicable
	N.O.S. = Not Otherwise Specified
	Volatile organic compounds
	mg/kg bodyweight
	Quantitative structure-activity relationship (QSAR)

	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
	ABM = Algemene beoordelingsmethodiek
	BTT = Breakthrough time (maximum wearing time)
	NOEL: no-observed-effect level
	STOT = Specific Target Organ Toxicity

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

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

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

Full text of H- and EUH-statements:

Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Flam. Liq. 3	Flammable liquids, Category 3
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Narcosis
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H411	Toxic to aquatic life with long lasting effects.

Full text of use descriptors

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC8e	Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
ESVOC SPERC 4.10a.v1	Use as binders and release agents: Industrial (SU3)
ESVOC SPERC 4.3a.v1	Uses in coatings: Industrial (Su3)
ESVOC SPERC 4.4a.v1	Use in cleaning agents: Industrial (SU3)
ESVOC SPERC 4.6a.v1	Lubricants: Industrial (SU3)
ESVOC SPERC 4.7a.v1	Metal working fluids and rolling oilds: Industrial (SU3)
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)
ESVOC SPERC 7.13a.v1	Functional fluids: Industrial (SU3)
ESVOC SPERC 8.10b.v1	Use as binders and release agents: Professional (SU22)
ESVOC SPERC 8.11a.v1	Agrochemical uses: Professional (SU22)
ESVOC SPERC 8.11b.v1	Agrochemical uses: Consumer (SU21)
ESVOC SPERC 8.15.v1	Road and Construction applications: Professional (SU22)
ESVOC SPERC 8.3b.v1	Uses in coatings: Professional (SU22)
ESVOC SPERC 8.3c.v1	Uses in coatings: Consumer (SU21)
ESVOC SPERC 8.4b.v1	Use in cleaning agents: Professional (SU22)
ESVOC SPERC 8.4c.v1	Use in cleaning agents: Consumer (SU21)
ESVOC SPERC 8.6c.v1	Lubricants: Professional (SU22) - high environmental release
ESVOC SPERC 8.6e.v1	Lubricants: Consumer (SU21) - high environmental release
ESVOC SPERC 8.7c.v1	Metal working fluids and rolling oilds: Professional (SU22) - high environmental release
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)
ESVOC SPERC 9.6b.v1	Lubricants: Professional (SU22) - low environmental release
ESVOC SPERC 9.6d.v1	Lubricants: Consumer (SU21) - low environmental release
PC0	Other
PC1	Adhesives, sealants
PC10	Building and construction preparations not covered elsewhere
PC12	Fertilizers
PC13	Fuels
PC15	Non-metal-surface treatment products
PC18	Ink and Toners
PC23	Leather treatment products
PC24	Lubricants, greases, release products
PC27	Plant protection products
PC3	Air care products
PC31	Glansmiddelen en wasmengsels
PC34	Textile dyes, finishing and impregnating products; including bleaches and other processing aids

PC35	Washing and cleaning products (including solvent based products)
PC38	Welding and soldering products, flux products
PC4	Anti-Freeze and De-icing products
PC5	Artists Supply and Hobby preparations
PC8	Biocidal products
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PC9c	Finger paints
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC15	Use as laboratory reagent
PROC16	Use of fuels
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC19	Manual activities involving hand contact
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC20	Use of functional fluids in small devices
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC6	Calendering operations
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU9	Manufacture of fine chemicals

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

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or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

Annex to the safety data sheet

Annex : Identified uses						
Title	**Sector of use**	**Product category**	**Process category**	**Article category**	**Environmental release**	**SPERC**
Uses in coatings			PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19		ERC8a, ERC8d	ESVOC SPERC 8.3b.v1
Uses in coatings		PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34			ERC8a, ERC8d	ESVOC SPERC 8.3c.v1
Professional use in cleaning agents			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13		ERC8a, ERC8d	ESVOC SPERC 8.4b.v1
Use in cleaning agents		PC3, PC4, PC8, PC9a, PC24, PC35, PC38			ERC8a, ERC8d	ESVOC SPERC 8.4c.v1
Lubricants: Low environmental release			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20		ERC9a, ERC9b	ESVOC SPERC 9.6b.v1
Lubricants: High environmental release			PROC1, PROC2, PROC3, PROC4, PROC8a,		ERC8a, ERC8d	ESVOC SPERC 8.6c.v1

			PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20			
Lubricants: Low environmental release		PC1, PC24, PC31			ERC9a, ERC9b	ESVOC SPERC 9.6d.v1
Lubricants: High environmental release		PC1, PC24, PC31			ERC8a, ERC8d	ESVOC SPERC 8.6e.v1
Metal working fluids / rolling oils			PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17		ERC8a, ERC8d	ESVOC SPERC 8.7c.v1
Use as binders and release agents			PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14		ERC8a, ERC8d	ESVOC SPERC 8.10b.v1
Use in agrochemicals			PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13		ERC8a, ERC8d	ESVOC SPERC 8.11a.v1
Use in agrochemicals		PC12, PC27			ERC8a, ERC8d	ESVOC SPERC 8.11b.v1
Road and construction applications			PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13		ERC8d, ERC8f	ESVOC SPERC 8.15.v1
Explosives manufacture & use			PROC1, PROC3, PROC5, PROC8a,		ERC8e	

			PROC8b			
Use as an intermediate	SU8, SU9		PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Distribution of substance			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Formulation & (re)packing of substances and mixtures			PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15		ERC2	ESVOC SPERC 2.2.v1
Uses in coatings			PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15		ERC4	ESVOC SPERC 4.3a.v1
Uses in coatings			PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19		ERC8a, ERC8d	ESVOC SPERC 8.3b.v1
Uses in coatings		PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34			ERC8a, ERC8d	ESVOC SPERC 8.3c.v1

Industrial use in cleaning agents : Not applicable EC 265-198-5)			PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13		ERC4	ESVOC SPERC 4.4a.v1
Professional use in cleaning agents			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13		ERC8a, ERC8d	ESVOC SPERC 8.4b.v1
Use in cleaning agents		PC3, PC4, PC8, PC9a, PC24, PC35, PC38			ERC8a, ERC8d	ESVOC SPERC 8.4c.v1
Lubricants			PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18		ERC4, ERC7	ESVOC SPERC 4.6a.v1
Lubricants: Low environmental release			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20		ERC9a, ERC9b	ESVOC SPERC 9.6b.v1
Lubricants: High environmental release			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13,		ERC8a, ERC8d	ESVOC SPERC 8.6c.v1

			PROC17, PROC18, PROC20			
Lubricants: Low environmental release		PC1, PC24, PC31			ERC9a, ERC9b	ESVOC SPERC 9.6d.v1
Lubricants: High environmental release		PC1, PC24, PC31			ERC8a, ERC8d	ESVOC SPERC 8.6e.v1
Metal working fluids / rolling oils			PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17		ERC4	ESVOC SPERC 4.7a.v1
Metal working fluids / rolling oils			PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17		ERC8a, ERC8d	ESVOC SPERC 8.7c.v1
Use as binders and release agents			PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14		ERC4	ESVOC SPERC 4.10a.v1
Use as binders and release agents			PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14		ERC8a, ERC8d	ESVOC SPERC 8.10b.v1
Use in agrochemicals			PROC1, PROC2, PROC4,		ERC8a, ERC8d	ESVOC SPERC 8.11a.v1

			PROC8a, PROC8b, PROC11, PROC13			
Use in agrochemicals		PC12, PC27			ERC8a, ERC8d	ESVOC SPERC 8.11b.v1
Use as a fuel in industrial settings			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC7	ESVOC SPERC 7.12a.v1
Use as a fuel in professional settings			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC9a, ERC9b	ESVOC SPERC 9.12b.v1
Use as a fuel		PC13			ERC9a, ERC9b	ESVOC SPERC 9.12c.v1
Functional fluids			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9		ERC7	ESVOC SPERC 7.13a.v1
Road and construction applications			PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13		ERC8d, ERC8f	ESVOC SPERC 8.15.v1
Explosives manufacture & use			PROC1, PROC3, PROC5, PROC8a, PROC8b		ERC8e	

1. Exposure scenario 06

Uses in coatings

ES Ref.: 06 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19 ERC8a, ERC8d
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. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC15	Use as laboratory reagent
PROC19	Manual activities involving hand contact

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems),CS38 - Use in contained systems	No other specific measures identified.	
General exposures (closed systems),CS56 - with sample collection,CS38 - Use in contained systems	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers.	No other specific measures identified.	
Preparation of material for application,CS29 - Mixing	No other specific measures identified.	

operations (closed systems)		
Film formation - air drying,outdoor	No other specific measures identified.	
Preparation of material for application,indoor	No other specific measures identified.	
Preparation of material for application,CS30 - Mixing operations (open systems),Pouring from small containers,indoor	No other specific measures identified.	
Preparation of material for application,CS30 - Mixing operations (open systems),Pouring from small containers,outdoor	No other specific measures identified.	
CS3 - Material transfers,CS8 - Drum/batch transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS3 - Material transfers,CS8 - Drum/batch transfers,CS81 - Dedicated facility	No other specific measures identified.	
CS3 - Material transfers,CS8 - Drum/batch transfers	No other specific measures identified.	
Roller, spreader, flow application,indoor	No other specific measures identified.	
Roller, spreader, flow application,outdoor	No other specific measures identified.	
CS10 - Spraying,CS34 - Manual,indoor	No other specific measures identified.	
CS10 - Spraying,CS34 - Manual,outdoor	No other specific measures identified.	
CS4 - Dipping, immersion and pouring,indoor	No other specific measures identified.	
CS4 - Dipping, immersion and pouring,outdoor	No other specific measures identified.	
CS36 - Laboratory activities	No other specific measures identified.	
CS72 - Hand application - fingerpaints, pastels, adhesives,indoor	No other specific measures identified.	
CS72 - Hand application - fingerpaints, pastels, adhesives,outdoor	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage,Product sampling	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	140
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,072
	Maximum daily site tonnage (kg/day)	0,2
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	

limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,9
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	3,1
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 07

Uses in coatings

ES Ref.: 07 ES Type: Consumer	

Use descriptors	PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34 ERC8a, ERC8d ESVOC SPERC 8.3c.v1
Processes, tasks activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34)

PC1	Adhesives, sealants
PC4	Anti-Freeze and De-icing products
PC5	Artists Supply and Hobby preparations
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PC9c	Finger paints
PC10	Building and construction preparations not covered elsewhere
PC15	Non-metal-surface treatment products
PC18	Ink and Toners
PC23	Leather treatment products
PC24	Lubricants, greases, release products
PC31	Glansmiddelen en wasmengsels
PC34	Textile dyes, finishing and impregnating products; including bleaches and other processing aids

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to	
	Covers skin contact area up to (cm2)	
Frequency and duration of use	unless stated differently,covers use up to 1 time/on day of use	
	Covers exposure up to,for each use event, covers exposure up to	6 hours
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 110. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73

		cm². For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 1. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 110 cm². For each use event, covers use amounts up to: 6390 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 6,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 85,05 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 55. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 75 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,00. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,02. Hours/event .
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use

		in room size of 34 m³. Covers exposure up to 0,17. Hours/event .
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 36 cm². For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,25. Hours/event .
	Artists Supply and Hobby mixtures	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 110. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 4. Hours/event .
	Coatings and paints, thinners, paint removers,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 4. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 2760 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event .
	Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event .
	Coatings and paints, thinners, paint removers,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 2. days/year . covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,33. Hours/event .
	Coatings and paints, thinners, paint	Unless otherwise stated.

	removers,Removers (paint-, glue-, wall paper-, sealant-remover)	Covers concentrations up to 50 %. Covers use up to 3. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^3. For each use event, covers use amounts up to: 491 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,00. Hours/event .
	Fillers, putties, plasters, modelling clay,Fillers and putty	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 12. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 35,73 cm^2. For each use event, covers use amounts up to: 85 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 4,00. Hours/event .
	Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	Unless otherwise stated. Covers concentrations up to 3 %. Covers use up to 12. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 13800 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,00. Hours/event .
	Fillers, putties, plasters, modelling clay,Modelling clay	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 254,40 cm^2. For each use event, assumes swallowed amount of . 1 g.
	Finger paints,Finger paints	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 254,40 cm^2. For each use event, assumes swallowed amount of . 1,35 g.
	Building and construction mixtures not covered elsewhere	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 428.75 cm^2. For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2.20. Hours/event .

	Non-metal-surface treatment products,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 4. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 428,75 cm^2. For each use event, covers use amounts up to: 2760 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event .
	Non-metal-surface treatment products,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm^2. For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event .
	Non-metal-surface treatment products,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,33. Hours/event
	Non-metal-surface treatment products,Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated. Covers concentrations up to 90 %. Covers use up to 3. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 491 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,00. Hours/event .
	Ink and toners,Ink and Toners	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 35,70 cm^2. For each use event, covers use amounts up to: 40 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event .
	Leather tanning, dye, finishing, impregnation and care products,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 29. days/year . covers use up to 1 time/on day of use . Covers

		skin contact area up to 430 cm². For each use event, covers use amounts up to: 56 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,23. Hours/event .
	Leather tanning, dye, finishing, impregnation and care products,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 8. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 56 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event .
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 100 %. Covers use up to 4. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm². For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,17. Hours/event .
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20 %. Covers use up to 10. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm². For each use event, covers use amounts up to: 34 g.
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event .
	Polishes and wax blends,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 15 %. Covers use up to 29. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,23.

		Hours/event .
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 8. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 430 cm^2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 0,33. Hours/event .
	Textile dyes, finishing and impregnating products; including bleaches and other processing aids	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 55. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 115 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 1,00. Hours/event

Risk management measures

Other risk management measures:

Adhesives, Sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Sealants	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	No specific risk management measure identified beyond those operational conditions stated.	
Artists Supply and Hobby mixtures	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Fillers and putty	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Modelling clay	No specific risk management measure identified beyond those operational conditions stated.	
Finger paints,Finger paints	No specific risk management measure identified beyond those operational conditions stated.	
Building and construction mixtures not covered elsewhere	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	

Non-metal-surface treatment products,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Ink and toners,Ink and Toners	No specific risk management measure identified beyond those operational conditions stated.	
Leather tanning, dye, finishing, impregnation and care products,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Leather tanning, dye, finishing, impregnation and care products,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Textile dyes, finishing and impregnating products; including bleaches and other processing aids	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.3c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.3c.v1	Uses in coatings: Consumer (SU21)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	12
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,006
	Maximum daily site tonnage (kg/day)	0,016
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,985
	Release fraction to wastewater from wide dispersive use:	0,01
	Release fraction to soil from wide dispersive use (regional only):	0,005

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,26
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment	External treatment and disposal of waste should	

of waste for disposal	comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 09

Professional use in cleaning agents

ES Ref.: 09 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13 ERC8a, ERC8d ESVOC SPERC 8.4b.v1
Processes, tasks activities covered	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand). Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
CS45 - Filling/ preparation of equipment from drums or	No other specific measures identified.	

containers,CS82 - Non-dedicated facility		
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS55 - Batch process	No other specific measures identified.	
CS37 - Use in contained batch processes,CS76 - Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No other specific measures identified.	
CS93 - Automated process with (semi) closed systems,CS38 - Use in contained systems	No other specific measures identified.	
CS93 - Automated process with (semi) closed systems,CS38 - Use in contained systems,CS8 - Drum/batch transfers	No other specific measures identified.	
CS37 - Use in contained batch processes,CS76 - Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No other specific measures identified.	
CS34 - Manual,CS47 - Cleaning,CS48 - Surfaces,CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS42 - Cleaning with low-pressure washers,CS51 - Rolling, Brushing,CS60 - no spraying	No other specific measures identified.	
CS44 - Cleaning with high pressure washers,CS10 - Spraying,indoor	No other specific measures identified.	
CS34 - Manual,CS47 - Cleaning,CS50 - Wiping,CS51 - Rolling, Brushing,CS10 - Spraying,CS48 - Surfaces	No other specific measures identified.	
CS41 - Degreasing small objects in cleaning station,CS27 - Ad hoc manual application via trigger sprays, dipping, etc,CS50 - Wiping,CS51 - Rolling, Brushing	No other specific measures identified.	
CS46 - Large surfaces,CS44 - Cleaning with high pressure washers,CS10 - Spraying,indoor	No other specific measures identified.	
CS101 - Application of cleaning products in closed systems,outdoor	No other specific measures identified.	
CS74 - Cleaning of medical devices	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage,CS137 - With occasional controlled exposure.	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.4b.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.4b.v1	Use in cleaning agents: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2700
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1,3
	Maximum daily site tonnage (kg/day)	3,7
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,02
	Release fraction to wastewater from wide dispersive use:	0,000001

	Release fraction to soil from wide dispersive use (regional only):	0

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,6
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	58
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 10

Use in cleaning agents

ES Ref.: 10 ES Type: Consumer	

Use descriptors	PC3, PC4, PC8, PC9a, PC24, PC35, PC38 ERC8a, ERC8d ESVOC SPERC 8.4c.v1
Processes, tasks activities covered	Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC3, PC4, PC8, PC9a, PC24, PC35, PC38)

PC3	Air care products
PC4	Anti-Freeze and De-icing products
PC8	Biocidal products
PC9a	Coatings and paints, thinners, paint removers
PC24	Lubricants, greases, release products
PC35	Washing and cleaning products (including solvent based products)
PC38	Welding and soldering products, flux products

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	2760
	Covers skin contact area up to (cm2)	
Frequency and duration of use	unless stated differently,Covers use up to	4 Uses per day
	Covers exposure up to	8 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0.1 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,25. Hours/event
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers

		skin contact area up to 35,70 cm². For each use event, covers use amounts up to: 0.48 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 8. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,02. Hours/event
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 13. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,25. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Excipient only,Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 60%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 15 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,50. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 27

		g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214.40 cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Coatings and paints, thinners, paint removers,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 2760 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,33. Hours/event
	Coatings and paints, thinners, paint removers,Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated. Covers concentrations up to 90%. Covers use up to 3. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 491 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 2,00. Hours/event

	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 34 g. Covers use in room size of 20m3
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,77. Hours/event
	Washing and cleaning products (including solvent based products),Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 60%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 15 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,50. Hours/event
	Washing and cleaning products (including solvent based products),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 27 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event
	Washing and cleaning products (including solvent based products),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428

		cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Welding and soldering products (with flux coatings or flux cores), flux products,Note: assessment not in TRA	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 12 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 1,00. Hours/event

Risk management measures

Other risk management measures:

Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Welding and soldering products (with flux coatings or	No specific risk management measure identified	

flux cores), flux products,Note: assessment not in TRA	beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.4c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.4c.v1	Use in cleaning agents: Consumer (SU21)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	310
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,016
	Maximum daily site tonnage (kg/day)	0,042
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,67
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 12

Lubricants: Low environmental release

ES Ref.: 12 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20 ERC9a, ERC9b ESVOC SPERC 9.6b.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC20	Use of functional fluids in small devices

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent /	

	minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
Operation of equipment containing engine oils and similar	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,indoor	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,outdoor	No other specific measures identified.	
CS77 - Maintenance (of larger plant items) and machine set up	No other specific measures identified.	
Draining equipment (small items) e.g engine drains.	No other specific measures identified.	
CS78 - Engine lubricant service	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS10 - Spraying,with local exhaust ventilation	No other specific measures identified.	
CS10 - Spraying,without local exhaust ventilation	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b)

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	31
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,015
	Maximum daily site tonnage (kg/day)	Not available
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	

limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,66
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 13

Lubricants: High environmental release

ES Ref.: 13 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20 ERC8a, ERC8d ESVOC SPERC 8.6c.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC20	Use of functional fluids in small devices

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately.	

	Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
Operation of equipment containing engine oils and similar	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,indoor	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,outdoor	No other specific measures identified.	
CS77 - Maintenance (of larger plant items) and machine set up	No other specific measures identified.	
Draining equipment (small items) e.g engine drains.	No other specific measures identified.	
CS78 - Engine lubricant service	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS10 - Spraying	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.6c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.6c.v1	Lubricants: Professional (SU22) - high environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2,5
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0013
	Maximum daily site tonnage (kg/day)	0,0034
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	

limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,054
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 14

Lubricants: Low environmental release

ES Ref.: 14 ES Type: Consumer	

Use descriptors	PC1, PC24, PC31 ERC9a, ERC9b ESVOC SPERC 9.6d.v1
Processes, tasks activities covered	Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC24, PC31)

PC1	Adhesives, sealants
PC24	Lubricants, greases, release products
PC31	Glansmiddelen en wasmengsels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	2200
	Covers skin contact area up to (cm2)	468
Frequency and duration of use	unless stated differently,Covers use up to	4 Uses per day
	Covers exposure up to	8 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 30%. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 85,05 g. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event. Covers use up to

		6. days/year .
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 30%. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 75 g. Covers use in room size of 20 m3. Covers exposure up to 1,00. Hours/event. Covers use up to 365. days/year .
	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0.1 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 0,25. Hours/event. covers use up to 4 time/on day of use
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm^2. For each use event, covers use amounts up to: 0.48 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 8. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,02. Hours/event
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers

		skin contact area up to 214,40 cm2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,25. Hours/event
	Automotive care products,(in car spray)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm². For each use event, covers use amounts up to: 10g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34m³. Covers exposure up to 0,17. Hours/event .
	Automotive care products,(in car polish)	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 100 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,50. Hours/event
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 4. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 34 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75

		cm2. For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Polishes and wax blends,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use in room size of 20 m3. Covers exposure up to 1,23. Hours/event
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 8. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event

Risk management measures

Other risk management measures:

Adhesives, Sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Sealants	Avoid using at a product concentration greater than . 25%,Avoid using when windows closed.	
Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	Avoid using at a product concentration greater than . 12,5%	
Automotive care products,(in car spray)	Avoid using at a product concentration greater than . 6%	
Automotive care products,(in car polish)	Avoid using at a product concentration greater than . 12,5%	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.6d.v1)

ERC9a	Widespread use of functional fluid (indoor)

ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.6d.v1	Lubricants: Consumer (SU21) - low environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	7
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,0035
	Maximum daily site tonnage (kg/day)	0,0096
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,15
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

	on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 15

Lubricants: High environmental release

ES Ref.: 15 ES Type: Consumer	

Use descriptors	PC1, PC24, PC31 ERC8a, ERC8d ESVOC SPERC 8.6e.v1
Processes, tasks activities covered	Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC24, PC31)

PC1	Adhesives, sealants
PC24	Lubricants, greases, release products
PC31	Glansmiddelen en wasmengsels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	2200
	Covers skin contact area up to (cm2)	468
Frequency and duration of use	unless stated differently,Covers use up to	1 Uses per day
	Covers exposure up to	8 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 30%. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 85,05 g. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event. Covers use up to

		6. days/year . covers use up to 1 time/on day of use. Covers use under typical household ventilation.
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 30%. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 75 g. Covers use in room size of 20 m3. Covers exposure up to 1,00. Hours/event. Covers use up to 365. days/year .
	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 4 time/on day of use. For each use event, covers use amounts up to: 0.1 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,25. Hours/event
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm². For each use event, covers use amounts up to: 0.48 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 8. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,02. Hours/event
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 55.

		days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,25. Hours/event
	Automotive care products,(in car spray)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm². For each use event, covers use amounts up to: 10g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34m³. Covers exposure up to 0,17. Hours/event .
	Automotive care products,(in car polish)	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 100 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,50. Hours/event
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 4. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 34 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1

		time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Polishes and wax blends,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use in room size of 20 m3. Covers exposure up to 1,23. Hours/event
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 8. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event

Risk management measures

Other risk management measures:

Adhesives, Sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Sealants	Avoid using at a product concentration greater than . 25%,Avoid using when windows closed.	
Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	Avoid using at a product concentration greater than . 12,5%	
Automotive care products,(in car spray)	Avoid using at a product concentration greater than . 6%	
Automotive care products,(in car polish)	Avoid using at a product concentration greater than . 12,5%	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.6e.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.6e.v1	Lubricants: Consumer (SU21) - high environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	0,7
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,00035
	Maximum daily site tonnage (kg/day)	0,00096
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,015
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 17

Metal working fluids / rolling oils

ES Ref.: 17 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17 ERC8a, ERC8d ESVOC SPERC 8.7c.v1
Processes, tasks activities covered	Covers the use in formulated MWFs (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. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures	

	such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS2 - Process sampling	No other specific measures identified.	
CS79 - Metal machining operations	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS10 - Spraying	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance,CS81 - Dedicated facility	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance,CS82 - Non-dedicated facility	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.7c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.7c.v1	Metal working fluids and rolling oilds: Professional (SU22) - high environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	36
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,018
	Maximum daily site tonnage (kg/day)	0,049
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,9
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0

Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,78
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 19

Use as binders and release agents

ES Ref.: 19 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14 ERC8a, ERC8d ESVOC SPERC 8.10b.v1
Processes, tasks activities covered	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC6	Calendering operations
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC14	Tabletting, compression, extrusion, pelettisation, granulation

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	

CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS29 - Mixing operations (closed systems)	No other specific measures identified.	
CS30 - Mixing operations (open systems)	No other specific measures identified.	
CS31 - Mold forming	No other specific measures identified.	
CS32 - Casting operations	No other specific measures identified.	
CS33 - Machine,CS10 - Spraying	No other specific measures identified.	
CS34 - Manual,CS10 - Spraying	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.10b.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.10b.v1	Use as binders and release agents: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2,8
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0014
	Maximum daily site tonnage (kg/day)	0,0038
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	0,061

	(kg/d):	
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 20

Use in agrochemicals

ES Ref.: 20 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13 ERC8a, ERC8d ESVOC SPERC 8.11a.v1
Processes, tasks activities covered	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
CS22 - Transfer from/pouring from containers	No other specific measures identified.	
CS23 - Mixing in containers.	No other specific measures identified.	
CS24 - Spraying/ fogging by manual application	No other specific measures identified.	
CS25 - Spraying/ fogging by machine application	No other specific measures identified.	
CS27 - Ad hoc manual application via trigger sprays,	No other specific measures identified.	

dipping, etc.		
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.11a.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.11a.v1	Agrochemical uses: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	930
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1,9
	Maximum daily site tonnage (kg/day)	5,1
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	26,2
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	74
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 21

Use in agrochemicals

ES Ref.: 21 ES Type: Consumer	

Use descriptors	PC12, PC27 ERC8a, ERC8d ESVOC SPERC 8.11b.v1
Processes, tasks activities covered	Covers the consumer use of agrochemicals in liquid and solid forms. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC12, PC27)

PC12	Fertilizers
PC27	Plant protection products

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Unless otherwise stated, Covers concentrations up to 50%
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	50
	Covers skin contact area up to (cm2)	
Frequency and duration of use	unless stated differently,Covers use up to	1 Uses per day
	Covers exposure up to	Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Fertilizers,Lawn and garden preparations	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, assumes swallowed amount of . 0,3 g. For each use event, covers use amounts up to: 50g. Covers outdoor use. Covers use in room size of 100 m^3. Covers exposure up to 0,15. Hours/event
	Lawn and Garden Mixtures, including fertilizers	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, assumes swallowed amount of . 0,3 g. For each use event, covers use amounts up to: 50 g. Covers outdoor use. Covers

		use in room size of 100 m³. Covers exposure up to 0,50. Hours/event
	Plant protection products,instant action (pump action sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 4 time/on day of use. For each use event, assumes swallowed amount of . 0,1 g. Covers exposure up to 0,25. Hours/event. For each use event, covers use amounts up to: 50g. Covers use in room size of 20m³. Covers use under typical household ventilation.
	Plant protection products,continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm2. For each use event, assumes swallowed amount of . 0,1 g. Covers exposure up to 8. Hours/event. For each use event, covers use amounts up to: 0,48g. Covers outdoor use. Covers use in room size of 20m³. Covers use under typical household ventilation.
	Plant protection products,aerosol spray applications	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 110. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, assumes swallowed amount of . 0,1 g. Covers exposure up to 4. Hours/event. For each use event, covers use amounts up to: 85,05g. Covers outdoor use. Covers use in room size of 20m³. Covers use under typical household ventilation.

Risk management measures

Other risk management measures:

Fertilizers,Lawn and garden preparations	No specific risk management measure identified beyond those operational conditions stated.	
Lawn and Garden Mixtures, including fertilizers	No specific risk management measure identified beyond those operational conditions stated.	
Plant protection products,instant action (pump action sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Plant protection products,continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Plant protection products,aerosol spray applications	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics	
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions		
Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,2
	Maximum daily site tonnage (kg/day)	0,55
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures		
Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	8,6
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 26

Road and construction applications

ES Ref.: 26	
ES Type: Worker	

Use descriptors	PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13 ERC8d, ERC8f ESVOC SPERC 8.15.v1
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. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
CS8 - Drum/batch transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS25 - Spraying/ fogging by machine application,Elevated temperature	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8d, ERC8f, ESVOC SPERC 8.15.v1)

ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ESVOC SPERC 8.15.v1	Road and Construction applications: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	9
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0045
	Maximum daily site tonnage (kg/day)	0,012
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,19
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 27

Explosives manufacture & use

ES Ref.: 27 ES Type: Worker	

Use descriptors	PROC1, PROC3, PROC5, PROC8a, PROC8b ERC8e
Processes, tasks activities covered	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC3, PROC5, PROC8a, PROC8b)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers,CS81 - Dedicated facility	No other specific measures identified.	
CS14 - Bulk transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS23 - Mixing in containers.	No other specific measures identified.	
CS22 - Transfer from/pouring from containers,CS81 - Dedicated facility	No other specific measures identified.	
CS22 - Transfer from/pouring from containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8e)

ERC8e	Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0025
	Maximum daily site tonnage (kg/day)	0,0068
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,11
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

1. Exposure scenario 01b

Use as an intermediate

ES Ref.: 01b ES Type: Worker Version: 2 (ref CONCAWE 2019)	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 SU8, SU9 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks activities covered	Use as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature),Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	For further information refer to section 8: "Exposure controls/personal protection"	

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	No other specific measures identified.	

CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS2 - Process sampling	No other specific measures identified.	
CS36 - Laboratory activities	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

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

ERC6a	Use of intermediate
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	270000
	Fraction of regional tonnage used locally:	0,055
	Annual site tonnage (tons/year):	15000
	Maximum daily site tonnage (kg/day)	50000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,01 %
	Release fraction to wastewater from process (initial release prior to RMM):	0,0003 %
	Release fraction to soil from process (initial release prior to RMM):	0,001 %

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment,Prevent discharge of undissolved substance to or recover from onsite wastewater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	80
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,1
	Maximum allowable site tonnage (MSafe) based on	EC 265-198-5 = 59000 / EC

	release following total wastewater treatment removal (kg/d):	265-184-9 = 79000
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : 0.00061 / EC 265-198-5 = 0,00067,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : 0.63 / EC 265-198-5 = 0,85

1. Exposure scenario 01a

Distribution of substance

ES Ref.: 01a ES Type: Worker Version: 2 (ref CONCAWE 2019)	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15 ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1
Processes, tasks activities covered	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

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

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	For further information refer to section 8: "Exposure controls/personal protection"	

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	

CS2 - Process sampling	No other specific measures identified.	
CS36 - Laboratory activities	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS6 - Drum and small package filling	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

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

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2400000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	4800
	Maximum daily site tonnage (kg/day)	48000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via	95,1

	domestic sewage treatment (%):	
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	EC 265-198-5 = 1800000 / EC 265-184-9 = 2400000
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : 0.00032 / EC 265-198-5 = 0,0000059,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : 0.02 / EC 265-198-5 = 0,0017

1. Exposure scenario 02

Formulation & (re)packing of substances and mixtures

ES Ref.: 02 ES Type: Worker Version: 2 (CONCAWE 2019)	

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

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14	Tabletting, compression, extrusion, pelettisation, granulation
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

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

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	For further information refer to section 8: "Exposure controls/personal protection"	

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems	

	that may develop	
General exposures (closed systems)	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS2 - Process sampling	No other specific measures identified.	
CS36 - Laboratory activities	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS30 - Mixing operations (open systems)	No other specific measures identified.	
CS34 - Manual,CS22 - Transfer from/pouring from containers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS100 - Production or preparation or articles by tabletting, compression, extrusion or pelletisation	No other specific measures identified.	
CS6 - Drum and small package filling	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

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

ERC2	Formulation into mixture
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2100000
	Fraction of regional tonnage used locally:	0,014
	Annual site tonnage (tons/year):	30000
	Maximum daily site tonnage (kg/day)	100000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment,Prevent discharge of undissolved substance to or recover from onsite wastewater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	0
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	EC 265-198-5 = 81,5% / EC 265-184-9 = 94,2
	If discharging to domestic sewage treatment plant,	0

	provide the required onsite wastewater removal efficiency of ≥ (%):	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	EC 265-198-5 = 88000 / EC 265-184-9 = 120000
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : 0.013 / EC 265-198-5 = 0,0036 ,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : 0.84 / EC 265-198-5 = 0,27

1. Exposure scenario 05

Uses in coatings

ES Ref.: 05 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15 ERC4 ESVOC SPERC 4.3a.v1
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. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures	

	such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
Film formation - force drying, stoving and other technologies	No other specific measures identified.	
CS29 - Mixing operations (closed systems)	No other specific measures identified.	
Film formation - air drying	No other specific measures identified.	
Preparation of material for application,CS30 - Mixing operations (open systems)	No other specific measures identified.	
Spraying (automatic/robotic)	No other specific measures identified.	
CS10 - Spraying,CS34 - Manual	No other specific measures identified.	
CS3 - Material transfers,CS81 - Dedicated facility	No other specific measures identified.	
CS3 - Material transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
Roller, spreader, flow application	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS36 - Laboratory activities	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage,Product sampling	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.3a.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 4.3a.v1	Uses in coatings: Industrial (Su3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	500
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	500
	Maximum daily site tonnage (kg/day)	25000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	0 %

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment,Prevent discharge of undissolved substance to or recover from onsite wastewater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	97,5

	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	49,7
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97,5
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	25000
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 06

Uses in coatings

ES Ref.: 06 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19 ERC8a, ERC8d
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. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC15	Use as laboratory reagent
PROC19	Manual activities involving hand contact

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures	

	such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems),CS38 - Use in contained systems	No other specific measures identified.	
General exposures (closed systems),CS56 - with sample collection,CS38 - Use in contained systems	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers.	No other specific measures identified.	
Preparation of material for application,CS29 - Mixing operations (closed systems)	No other specific measures identified.	
Film formation - air drying,outdoor	No other specific measures identified.	
Preparation of material for application,indoor	No other specific measures identified.	
Preparation of material for application,CS30 - Mixing operations (open systems),Pouring from small containers,indoor	No other specific measures identified.	
Preparation of material for application,CS30 - Mixing operations (open systems),Pouring from small containers,outdoor	No other specific measures identified.	
CS3 - Material transfers,CS8 - Drum/batch transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS3 - Material transfers,CS8 - Drum/batch transfers,CS81 - Dedicated facility	No other specific measures identified.	
CS3 - Material transfers,CS8 - Drum/batch transfers	No other specific measures identified.	
Roller, spreader, flow application,indoor	No other specific measures identified.	
Roller, spreader, flow application,outdoor	No other specific measures identified.	
CS10 - Spraying,CS34 - Manual,indoor	No other specific measures identified.	
CS10 - Spraying,CS34 - Manual,outdoor	No other specific measures identified.	
CS4 - Dipping, immersion and pouring,indoor	No other specific measures identified.	
CS4 - Dipping, immersion and pouring,outdoor	No other specific measures identified.	
CS36 - Laboratory activities	No other specific measures identified.	
CS72 - Hand application - fingerpaints, pastels, adhesives,indoor	No other specific measures identified.	
CS72 - Hand application - fingerpaints, pastels, adhesives,outdoor	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage,Product sampling	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	140
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,072
	Maximum daily site tonnage (kg/day)	0,2
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,9
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	3,1
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

	(http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 07

Uses in coatings

ES Ref.: 07 ES Type: Consumer	

Use descriptors	PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34 ERC8a, ERC8d ESVOC SPERC 8.3c.v1
Processes, tasks activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC4, PC5, PC9a, PC9b, PC9c, PC10, PC15, PC18, PC23, PC24, PC31, PC34)

PC1	Adhesives, sealants
PC4	Anti-Freeze and De-icing products
PC5	Artists Supply and Hobby preparations
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PC9c	Finger paints
PC10	Building and construction preparations not covered elsewhere
PC15	Non-metal-surface treatment products
PC18	Ink and Toners
PC23	Leather treatment products
PC24	Lubricants, greases, release products
PC31	Glansmiddelen en wasmengsels
PC34	Textile dyes, finishing and impregnating products; including bleaches and other processing aids

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to	
	Covers skin contact area up to (cm2)	
Frequency and duration of use	unless stated differently,covers use up to 1 time/on day of use	
	Covers exposure up to,for each use event, covers exposure up to	6 hours
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 110. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73

		cm². For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 1. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 110 cm². For each use event, covers use amounts up to: 6390 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 6,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 85,05 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 55. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 75 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,00. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,02. Hours/event .
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use

		in room size of 34 m³. Covers exposure up to 0,17. Hours/event .
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 36 cm². For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,25. Hours/event .
	Artists Supply and Hobby mixtures	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 110. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 35,73 cm². For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 4. Hours/event .
	Coatings and paints, thinners, paint removers,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 4. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 2760 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event .
	Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 2,20. Hours/event .
	Coatings and paints, thinners, paint removers,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 2. days/year . covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,33. Hours/event .
	Coatings and paints, thinners, paint	Unless otherwise stated.

	removers,Removers (paint-, glue-, wall paper-, sealant-remover)	Covers concentrations up to 50 %. Covers use up to 3. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^3. For each use event, covers use amounts up to: 491 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,00. Hours/event .
	Fillers, putties, plasters, modelling clay,Fillers and putty	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 12. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 35,73 cm^2. For each use event, covers use amounts up to: 85 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 4,00. Hours/event .
	Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	Unless otherwise stated. Covers concentrations up to 3 %. Covers use up to 12. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 13800 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,00. Hours/event .
	Fillers, putties, plasters, modelling clay,Modelling clay	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 254,40 cm^2. For each use event, assumes swallowed amount of . 1 g.
	Finger paints,Finger paints	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 254,40 cm^2. For each use event, assumes swallowed amount of . 1,35 g.
	Building and construction mixtures not covered elsewhere	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 428.75 cm^2. For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2.20. Hours/event .

	Non-metal-surface treatment products,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 4. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 428,75 cm^2. For each use event, covers use amounts up to: 2760 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event .
	Non-metal-surface treatment products,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm^2. For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event .
	Non-metal-surface treatment products,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,33. Hours/event
	Non-metal-surface treatment products,Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated. Covers concentrations up to 90 %. Covers use up to 3. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, covers use amounts up to: 491 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,00. Hours/event .
	Ink and toners,Ink and Toners	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 35,70 cm^2. For each use event, covers use amounts up to: 40 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 2,20. Hours/event .
	Leather tanning, dye, finishing, impregnation and care products,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 29. days/year . covers use up to 1 time/on day of use . Covers

		skin contact area up to 430 cm². For each use event, covers use amounts up to: 56 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,23. Hours/event .
	Leather tanning, dye, finishing, impregnation and care products,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 8. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 56 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event .
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 100 %. Covers use up to 4. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm². For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,17. Hours/event .
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20 %. Covers use up to 10. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm². For each use event, covers use amounts up to: 34 g.
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 6. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm². For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event .
	Polishes and wax blends,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 15 %. Covers use up to 29. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,23.

		Hours/event .
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 8. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,33. Hours/event .
	Textile dyes, finishing and impregnating products; including bleaches and other processing aids	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 55. days/year . covers use up to 1 time/on day of use . Covers skin contact area up to 857,50 cm². For each use event, covers use amounts up to: 115 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 1,00. Hours/event

Risk management measures

Other risk management measures:

Adhesives, Sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glues DIY-use (carpet glue, tile glue, wood parquet glue)	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Sealants	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	No specific risk management measure identified beyond those operational conditions stated.	
Artists Supply and Hobby mixtures	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Fillers and putty	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Plasters and floor equalizers	No specific risk management measure identified beyond those operational conditions stated.	
Fillers, putties, plasters, modelling clay,Modelling clay	No specific risk management measure identified beyond those operational conditions stated.	
Finger paints,Finger paints	No specific risk management measure identified beyond those operational conditions stated.	
Building and construction mixtures not covered elsewhere	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	

Non-metal-surface treatment products,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Non-metal-surface treatment products,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Ink and toners,Ink and Toners	No specific risk management measure identified beyond those operational conditions stated.	
Leather tanning, dye, finishing, impregnation and care products,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Leather tanning, dye, finishing, impregnation and care products,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Textile dyes, finishing and impregnating products; including bleaches and other processing aids	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.3c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.3c.v1	Uses in coatings: Consumer (SU21)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	12
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,006
	Maximum daily site tonnage (kg/day)	0,016
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,985
	Release fraction to wastewater from wide dispersive use:	0,01
	Release fraction to soil from wide dispersive use (regional only):	0,005

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,26
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment	External treatment and disposal of waste should	

of waste for disposal	comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 04a

Industrial use in cleaning agents

ES Ref.: 04a ES Type: Worker Version: 2 (CONCAWE 2019)	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13 ERC4 ESVOC SPERC 4.4a.v1
Comment	Industrial use : NA EC 265-198-5
Processes, tasks activities covered	Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

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

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	For further information refer to section 8: "Exposure controls/personal protection"	

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent /	

	minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS93 - Automated process with (semi) closed systems,CS38 - Use in contained systems	No other specific measures identified.	
CS93 - Automated process with (semi) closed systems,CS38 - Use in contained systems,CS8 - Drum/batch transfers	No other specific measures identified.	
CS101 - Application of cleaning products in closed systems	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS37 - Use in contained batch processes,CS76 - Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS42 - Cleaning with low-pressure washers	No other specific measures identified.	
CS44 - Cleaning with high pressure washers	No other specific measures identified.	
CS34 - Manual,CS47 - Cleaning,CS48 - Surfaces,CS60 - no spraying	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage,Product sampling	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.4a.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 4.4a.v1	Use in cleaning agents: Industrial (SU3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	3,8
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	3,8
	Maximum daily site tonnage (kg/day)	190
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	1 %
	Release fraction to wastewater from process (initial release prior to RMM):	0,000003 %
	Release fraction to soil from process (initial release prior to RMM):	0 %

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,Prevent discharge of undissolved substance to or recover from onsite wastewater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	70
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	33000
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : 0.00033,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : 0.0056

1. Exposure scenario 09

Professional use in cleaning agents

ES Ref.: 09 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13 ERC8a, ERC8d ESVOC SPERC 8.4b.v1
Processes, tasks activities covered	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand). Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
CS45 - Filling/ preparation of equipment from drums or	No other specific measures identified.	

containers,CS82 - Non-dedicated facility		
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS55 - Batch process	No other specific measures identified.	
CS37 - Use in contained batch processes,CS76 - Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No other specific measures identified.	
CS93 - Automated process with (semi) closed systems,CS38 - Use in contained systems	No other specific measures identified.	
CS93 - Automated process with (semi) closed systems,CS38 - Use in contained systems,CS8 - Drum/batch transfers	No other specific measures identified.	
CS37 - Use in contained batch processes,CS76 - Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products)	No other specific measures identified.	
CS34 - Manual,CS47 - Cleaning,CS48 - Surfaces,CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS42 - Cleaning with low-pressure washers,CS51 - Rolling, Brushing,CS60 - no spraying	No other specific measures identified.	
CS44 - Cleaning with high pressure washers,CS10 - Spraying,indoor	No other specific measures identified.	
CS34 - Manual,CS47 - Cleaning,CS50 - Wiping,CS51 - Rolling, Brushing,CS10 - Spraying,CS48 - Surfaces	No other specific measures identified.	
CS41 - Degreasing small objects in cleaning station,CS27 - Ad hoc manual application via trigger sprays, dipping, etc,CS50 - Wiping,CS51 - Rolling, Brushing	No other specific measures identified.	
CS46 - Large surfaces,CS44 - Cleaning with high pressure washers,CS10 - Spraying,indoor	No other specific measures identified.	
CS101 - Application of cleaning products in closed systems,outdoor	No other specific measures identified.	
CS74 - Cleaning of medical devices	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage,CS137 - With occasional controlled exposure.	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.4b.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.4b.v1	Use in cleaning agents: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2700
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1,3
	Maximum daily site tonnage (kg/day)	3,7
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,02
	Release fraction to wastewater from wide dispersive use:	0,000001

	Release fraction to soil from wide dispersive use (regional only):	0

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,6
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	58
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 10

Use in cleaning agents

ES Ref.: 10 ES Type: Consumer	

Use descriptors	PC3, PC4, PC8, PC9a, PC24, PC35, PC38 ERC8a, ERC8d ESVOC SPERC 8.4c.v1
Processes, tasks activities covered	Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC3, PC4, PC8, PC9a, PC24, PC35, PC38)

PC3	Air care products
PC4	Anti-Freeze and De-icing products
PC8	Biocidal products
PC9a	Coatings and paints, thinners, paint removers
PC24	Lubricants, greases, release products
PC35	Washing and cleaning products (including solvent based products)
PC38	Welding and soldering products, flux products

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	2760
	Covers skin contact area up to (cm2)	
Frequency and duration of use	unless stated differently,Covers use up to	4 Uses per day
	Covers exposure up to	8 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0.1 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,25. Hours/event
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers

		skin contact area up to 35,70 cm². For each use event, covers use amounts up to: 0.48 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 8. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,02. Hours/event
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 13. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,25. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Excipient only,Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 60%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 15 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,50. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 27

		g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event
	Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214.40 cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Coatings and paints, thinners, paint removers,Waterborne latex wall paint	Unless otherwise stated. Covers concentrations up to 50 %. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 2760 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Solvent rich, high solid, water borne paint	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 744 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 2,20. Hours/event
	Coatings and paints, thinners, paint removers,Aerosol spray can	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 2. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 215 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,33. Hours/event
	Coatings and paints, thinners, paint removers,Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated. Covers concentrations up to 90%. Covers use up to 3. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 491 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 2,00. Hours/event

	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 4. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 34 g. Covers use in room size of 20m3
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,77. Hours/event
	Washing and cleaning products (including solvent based products),Laundry and dish washing products	Unless otherwise stated. Covers concentrations up to 60%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 15 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,50. Hours/event
	Washing and cleaning products (including solvent based products),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, covers use amounts up to: 27 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event
	Washing and cleaning products (including solvent based products),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 128. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428

		cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Welding and soldering products (with flux coatings or flux cores), flux products,Note: assessment not in TRA	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 12 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 1,00. Hours/event

Risk management measures

Other risk management measures:

Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Biocidal products (e.g. Disinfectants, pest control),Excipient only,Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Waterborne latex wall paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Solvent rich, high solid, water borne paint	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Aerosol spray can	No specific risk management measure identified beyond those operational conditions stated.	
Coatings and paints, fillers, putties, thinners,Removers (paint-, glue-, wall paper-, sealant-remover)	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Laundry and dish washing products	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Washing and cleaning products (including solvent based products),Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	No specific risk management measure identified beyond those operational conditions stated.	
Welding and soldering products (with flux coatings or	No specific risk management measure identified	

flux cores), flux products,Note: assessment not in TRA	beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.4c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.4c.v1	Use in cleaning agents: Consumer (SU21)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	310
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,016
	Maximum daily site tonnage (kg/day)	0,042
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,67
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 11

Lubricants

ES Ref.: 11 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18 ERC4, ERC7 ESVOC SPERC 4.6a.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures	

	such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers.	No other specific measures identified.	
CS75 - Initial factory fill of equipment	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
CS10 - Spraying	No other specific measures identified.	
CS77 - Maintenance (of larger plant items) and machine set up	No other specific measures identified.	
CS18 - Maintenance of small items	No other specific measures identified.	
CS19 - Remanufacture of reject articles	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC7, ESVOC SPERC 4.6a.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 4.6a.v1	Lubricants: Industrial (SU3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	55
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	55
	Maximum daily site tonnage (kg/day)	2700
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,Prevent discharge of undissolved substance to or recover from onsite wastewater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	70
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	29,2
	If discharging to domestic sewage treatment plant,	0

	provide the required onsite wastewater removal efficiency of ≥ (%):	
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	38000
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 12

Lubricants: Low environmental release

ES Ref.: 12 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20 ERC9a, ERC9b ESVOC SPERC 9.6b.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC20	Use of functional fluids in small devices

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent /	

	minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
Operation of equipment containing engine oils and similar	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,indoor	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,outdoor	No other specific measures identified.	
CS77 - Maintenance (of larger plant items) and machine set up	No other specific measures identified.	
Draining equipment (small items) e.g engine drains.	No other specific measures identified.	
CS78 - Engine lubricant service	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS10 - Spraying,with local exhaust ventilation	No other specific measures identified.	
CS10 - Spraying,without local exhaust ventilation	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b)

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	31
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,015
	Maximum daily site tonnage (kg/day)	Not available
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	

limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,66
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 13

Lubricants: High environmental release

ES Ref.: 13 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20 ERC8a, ERC8d ESVOC SPERC 8.6c.v1
Processes, tasks activities covered	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations
PROC18	General greasing /lubrication at high kinetic energy conditions
PROC20	Use of functional fluids in small devices

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately.	

	Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
Operation of equipment containing engine oils and similar	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,indoor	No other specific measures identified.	
CS17 - Operation and lubrication of high energy open equipment,outdoor	No other specific measures identified.	
CS77 - Maintenance (of larger plant items) and machine set up	No other specific measures identified.	
Draining equipment (small items) e.g engine drains.	No other specific measures identified.	
CS78 - Engine lubricant service	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS10 - Spraying	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.6c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.6c.v1	Lubricants: Professional (SU22) - high environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2,5
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0013
	Maximum daily site tonnage (kg/day)	0,0034
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	

limit discharges, air emissions and releases to soil	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,054
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 14

Lubricants: Low environmental release

ES Ref.: 14 ES Type: Consumer	

Use descriptors	PC1, PC24, PC31 ERC9a, ERC9b ESVOC SPERC 9.6d.v1
Processes, tasks activities covered	Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC24, PC31)

PC1	Adhesives, sealants
PC24	Lubricants, greases, release products
PC31	Glansmiddelen en wasmengsels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	2200
	Covers skin contact area up to (cm2)	468
Frequency and duration of use	unless stated differently,Covers use up to	4 Uses per day
	Covers exposure up to	8 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 30%. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 85,05 g. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event. Covers use up to

		6. days/year .
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 30%. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 75 g. Covers use in room size of 20 m3. Covers exposure up to 1,00. Hours/event. Covers use up to 365. days/year .
	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0.1 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 0,25. Hours/event. covers use up to 4 time/on day of use
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm^2. For each use event, covers use amounts up to: 0.48 g. Covers use under typical household ventilation. Covers use in room size of 20 m^3. Covers exposure up to 8. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,02. Hours/event
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m^3) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers

		skin contact area up to 214,40 cm2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,25. Hours/event
	Automotive care products,(in car spray)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm². For each use event, covers use amounts up to: 10g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34m³. Covers exposure up to 0,17. Hours/event .
	Automotive care products,(in car polish)	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 100 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,50. Hours/event
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 4. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 34 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428,75

		cm2. For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Polishes and wax blends,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use in room size of 20 m3. Covers exposure up to 1,23. Hours/event
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 8. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event

Risk management measures

Other risk management measures:

Adhesives, Sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Sealants	Avoid using at a product concentration greater than . 25%,Avoid using when windows closed.	
Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	Avoid using at a product concentration greater than . 12,5%	
Automotive care products,(in car spray)	Avoid using at a product concentration greater than . 6%	
Automotive care products,(in car polish)	Avoid using at a product concentration greater than . 12,5%	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.6d.v1)

ERC9a	Widespread use of functional fluid (indoor)

ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.6d.v1	Lubricants: Consumer (SU21) - low environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	7
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,0035
	Maximum daily site tonnage (kg/day)	0,0096
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,15
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

	on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 15

Lubricants: High environmental release

ES Ref.: 15 ES Type: Consumer	

Use descriptors	PC1, PC24, PC31 ERC8a, ERC8d ESVOC SPERC 8.6e.v1
Processes, tasks activities covered	Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC1, PC24, PC31)

PC1	Adhesives, sealants
PC24	Lubricants, greases, release products
PC31	Glansmiddelen en wasmengsels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	2200
	Covers skin contact area up to (cm2)	468
Frequency and duration of use	unless stated differently,Covers use up to	4 Uses per day
	Covers exposure up to	8 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Adhesives, sealants,Glues, hobby use	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 365. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 9 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event
	Adhesives, sealants,Glue from spray	Unless otherwise stated. Covers concentrations up to 30%. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 85,05 g. Covers use in room size of 20 m3. Covers exposure up to 4,00. Hours/event. Covers use up to

		6. days/year . covers use up to 1 time/on day of use. Covers use under typical household ventilation.
	Adhesives, sealants,Sealants	Unless otherwise stated. Covers concentrations up to 30%. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, covers use amounts up to: 75 g. Covers use in room size of 20 m3. Covers exposure up to 1,00. Hours/event. Covers use up to 365. days/year .
	Air care products,Air care, instant action (aerosol sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 4 time/on day of use. For each use event, covers use amounts up to: 0.1 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,25. Hours/event
	Air care products,Air care, continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm². For each use event, covers use amounts up to: 0.48 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 8. Hours/event
	Anti-Freeze and De-icing products,Washing car window	Unless otherwise stated. Covers concentrations up to 5%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 0,5 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,02. Hours/event
	Anti-Freeze and De-icing products,Pouring into radiator	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm2. For each use event, covers use amounts up to: 2000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Anti-Freeze and De-icing products,Lock de-icer	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 55.

		days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm2. For each use event, covers use amounts up to: 4 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,25. Hours/event
	Automotive care products,(in car spray)	Unless otherwise stated. Covers concentrations up to 10 %. Covers use up to 55. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 214,40 cm². For each use event, covers use amounts up to: 10g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34m³. Covers exposure up to 0,17. Hours/event .
	Automotive care products,(in car polish)	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 428 cm². For each use event, covers use amounts up to: 100 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure up to 0,50. Hours/event
	Lubricants, greases, release products,Liquids	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 4. days/year . covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 2200 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Pastes	Unless otherwise stated. Covers concentrations up to 20%. Covers use up to 10. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 468 cm2. For each use event, covers use amounts up to: 34 g. Covers use under typical household ventilation. Covers use in room size of 20 m³. Covers exposure up to 0,17. Hours/event
	Lubricants, greases, release products,Sprays	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 6. days/year. covers use up to 1

		time/on day of use. Covers skin contact area up to 428,75 cm2. For each use event, covers use amounts up to: 73 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,17. Hours/event
	Polishes and wax blends,Polishes, wax/cream (floor, furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 29. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm². For each use event, covers use amounts up to: 142 g. Covers use in room size of 20 m3. Covers exposure up to 1,23. Hours/event
	Polishes and wax blends,Polishes, spray (furniture, shoes)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 8. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 430 cm2. For each use event, covers use amounts up to: 35 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,33. Hours/event

Risk management measures

Other risk management measures:

Adhesives, Sealants,Glues, hobby use	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Glue from spray	No specific risk management measure identified beyond those operational conditions stated.	
Adhesives, Sealants,Sealants	Avoid using at a product concentration greater than . 25%,Avoid using when windows closed.	
Air care products,Air care, instant action (aerosol sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Air care products,Air care, continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Washing car window	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Pouring into radiator	No specific risk management measure identified beyond those operational conditions stated.	
Anti-freeze and de-icing products,Lock de-icer	Avoid using at a product concentration greater than . 12,5%	
Automotive care products,(in car spray)	Avoid using at a product concentration greater than . 6%	
Automotive care products,(in car polish)	Avoid using at a product concentration greater than . 12,5%	
Lubricants, greases, release products,liquids	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Pastes	No specific risk management measure identified beyond those operational conditions stated.	
Lubricants, greases, release products,Sprays	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, wax/cream (floor, furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	
Glansmiddelen en wasmengsels,Polishes, spray (furniture, shoes)	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.6e.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.6e.v1	Lubricants: Consumer (SU21) - high environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	0,7
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,00035
	Maximum daily site tonnage (kg/day)	0,00096
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,015
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 16

Metal working fluids / rolling oils

ES Ref.: 16 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17 ERC4 ESVOC SPERC 4.7a.v1
Processes, tasks activities covered	Covers the use in formulated MWFs (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. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC7	Industrial spraying
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems	

	that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
CS16 - General exposures (open systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers.	No other specific measures identified.	
CS2 - Process sampling	No other specific measures identified.	
CS79 - Metal machining operations	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
CS10 - Spraying	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS80 - Automated metal rolling/forming	No other specific measures identified.	
CS83 - Semi-automated metal rolling/forming	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance,CS81 - Dedicated facility	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance,CS82 - Non-dedicated facility	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.7a.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 4.7a.v1	Metal working fluids and rolling oilds: Industrial (SU3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	27
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	27
	Maximum daily site tonnage (kg/day)	1400
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	0 %

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,Prevent discharge of undissolved substance to or recover from onsite wastewater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	70
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	25,1

	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	20000
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 17

Metal working fluids / rolling oils

ES Ref.: 17 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17 ERC8a, ERC8d ESVOC SPERC 8.7c.v1
Processes, tasks activities covered	Covers the use in formulated MWFs (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. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC17	Lubrication at high energy conditions in metal working operations

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures	

	such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
General exposures (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS81 - Dedicated facility	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS2 - Process sampling	No other specific measures identified.	
CS79 - Metal machining operations	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS10 - Spraying	No other specific measures identified.	
CS35 - Treatment by dipping and pouring	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance,CS81 - Dedicated facility	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance,CS82 - Non-dedicated facility	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.7c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.7c.v1	Metal working fluids and rolling oilds: Professional (SU22) - high environmental release
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	36
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,018
	Maximum daily site tonnage (kg/day)	0,049
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,9
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0

Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,78
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 18

Use as binders and release agents

ES Ref.: 18 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14 ERC4 ESVOC SPERC 4.10a.v1
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. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC6	Calendering operations
PROC7	Industrial spraying
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC13	Treatment of articles by dipping and pouring
PROC14	Tabletting, compression, extrusion, pelettisation, granulation

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	

CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS29 - Mixing operations (closed systems)	No other specific measures identified.	
CS30 - Mixing operations (open systems)	No other specific measures identified.	
CS31 - Mold forming	No other specific measures identified.	
CS32 - Casting operations	No other specific measures identified.	
CS33 - Machine,CS10 - Spraying	No other specific measures identified.	
CS34 - Manual,CS10 - Spraying	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.10a.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 4.10a.v1	Use as binders and release agents: Industrial (SU3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	51
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51
	Maximum daily site tonnage (kg/day)	2600
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	1 %
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	0 %

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,Prevent discharge of undissolved substance to or recover from onsite wastewater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	80
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	21,5
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	40000

	(kg/d):	
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 19

Use as binders and release agents

ES Ref.: 19 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14 ERC8a, ERC8d ESVOC SPERC 8.10b.v1
Processes, tasks activities covered	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC6	Calendering operations
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC14	Tabletting, compression, extrusion, pelettisation, granulation

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	

CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS29 - Mixing operations (closed systems)	No other specific measures identified.	
CS30 - Mixing operations (open systems)	No other specific measures identified.	
CS31 - Mold forming	No other specific measures identified.	
CS32 - Casting operations	No other specific measures identified.	
CS33 - Machine,CS10 - Spraying	No other specific measures identified.	
CS34 - Manual,CS10 - Spraying	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.10b.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.10b.v1	Use as binders and release agents: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	2,8
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0014
	Maximum daily site tonnage (kg/day)	0,0038
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	0,061

	(kg/d):	
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 20

Use in agrochemicals

ES Ref.: 20 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13 ERC8a, ERC8d ESVOC SPERC 8.11a.v1
Processes, tasks activities covered	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
CS22 - Transfer from/pouring from containers	No other specific measures identified.	
CS23 - Mixing in containers.	No other specific measures identified.	
CS24 - Spraying/ fogging by manual application	No other specific measures identified.	
CS25 - Spraying/ fogging by machine application	No other specific measures identified.	
CS27 - Ad hoc manual application via trigger sprays,	No other specific measures identified.	

dipping, etc.		
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.11a.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.11a.v1	Agrochemical uses: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	930
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1,9
	Maximum daily site tonnage (kg/day)	5,1
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	26,2
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	74
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 21

Use in agrochemicals

ES Ref.: 21 ES Type: Consumer	

Use descriptors	PC12, PC27 ERC8a, ERC8d ESVOC SPERC 8.11b.v1
Processes, tasks activities covered	Covers the consumer use of agrochemicals in liquid and solid forms. Consumer use (C)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC12, PC27)

PC12	Fertilizers
PC27	Plant protection products

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Unless otherwise stated, Covers concentrations up to 50%
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	50
	Covers skin contact area up to (cm2)	
Frequency and duration of use	unless stated differently,Covers use up to	1 Uses per day
	Covers exposure up to	Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Fertilizers,Lawn and garden preparations	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm2. For each use event, assumes swallowed amount of . 0,3 g. For each use event, covers use amounts up to: 50g. Covers outdoor use. Covers use in room size of 100 m^3. Covers exposure up to 0,15. Hours/event
	Lawn and Garden Mixtures, including fertilizers	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 857,50 cm^2. For each use event, assumes swallowed amount of . 0,3 g. For each use event, covers use amounts up to: 50 g. Covers outdoor use. Covers

		use in room size of 100 m³. Covers exposure up to 0,50. Hours/event
	Plant protection products,instant action (pump action sprays)	Unless otherwise stated. Covers concentrations up to 50%. Covers use up to 365. days/year. covers use up to 4 time/on day of use. For each use event, assumes swallowed amount of . 0,1 g. Covers exposure up to 0,25. Hours/event. For each use event, covers use amounts up to: 50g. Covers use in room size of 20m³. Covers use under typical household ventilation.
	Plant protection products,continuous action (solid and liquid)	Unless otherwise stated. Covers concentrations up to 10%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,70 cm2. For each use event, assumes swallowed amount of . 0,1 g. Covers exposure up to 8. Hours/event. For each use event, covers use amounts up to: 0,48g. Covers outdoor use. Covers use in room size of 20m³. Covers use under typical household ventilation.
	Plant protection products,aerosol spray applications	Unless otherwise stated. Covers concentrations up to 30%. Covers use up to 110. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 35,73 cm2. For each use event, assumes swallowed amount of . 0,1 g. Covers exposure up to 4. Hours/event. For each use event, covers use amounts up to: 85,05g. Covers outdoor use. Covers use in room size of 20m³. Covers use under typical household ventilation.

Risk management measures

Other risk management measures:

Fertilizers,Lawn and garden preparations	No specific risk management measure identified beyond those operational conditions stated.	
Lawn and Garden Mixtures, including fertilizers	No specific risk management measure identified beyond those operational conditions stated.	
Plant protection products,instant action (pump action sprays)	No specific risk management measure identified beyond those operational conditions stated.	
Plant protection products,continuous action (solid and liquid)	No specific risk management measure identified beyond those operational conditions stated.	
Plant protection products,aerosol spray applications	No specific risk management measure identified beyond those operational conditions stated.	

2.2 Contributing scenario controlling environmental exposure (ERC8a, ERC8d)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics	
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions		
Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	0,2
	Maximum daily site tonnage (kg/day)	0,55
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures		
Conditions and measures related to sewage treatment plant	Risk from environmental exposure is driven by the freshwater.	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	8,6
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Exposure scenario 12a

Use as a fuel in industrial settings

ES Ref.: 12a ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 ERC7 ESVOC SPERC 7.12a.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

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

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	For further information refer to section 8: "Exposure controls/personal protection"	

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	No other specific measures identified.	
Use as a fuel,CS107 - (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	

CS85 - Bulk product storage	No other specific measures identified.	

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

ERC7	Use of functional fluid at industrial site
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	370000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	370000
	Maximum daily site tonnage (kg/day)	1200000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	EC 265-198-5 = 20 / EC 265-184-9 = 300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	0 %

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required,EC 265-198-5: No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	95
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	EC 265-198-5 = 0 / EC 265-184-9 = 90,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2400000
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls,Combustion emissions considered in regional exposure assessment.	

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

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : 0.017 / EC 265-198-5 = 0,0000059,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : 0.52 / EC 265-198-5 = 0,00028

1. Exposure scenario 12b

Use as a fuel in professional settings

ES Ref.: 12b ES Type: Worker Version: 2 (CONCAWE 2019)	

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

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

Risk management measures

Conditions and measures related to personal protection, hygiene and health evaluation	For further information refer to section 8: "Exposure controls/personal protection"	

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	No other specific measures identified.	
Use as a fuel,CS107 - (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers	No other specific measures identified.	
CS22 - Transfer from/pouring from containers	No other specific measures identified.	

CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

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

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently)
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1700000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	840
	Maximum daily site tonnage (kg/day)	2300
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,001
	Release fraction to wastewater from wide dispersive use:	0,00001
	Release fraction to soil from wide dispersive use (regional only):	0,00001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls,Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery	This substance is consumed during use and no	

of waste	waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : EC 265-198-5 = 0,0000056,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : EC 265-198-5 = 0,00015

1. Exposure scenario 12c

Use as a fuel

ES Ref.: 12c ES Type: Consumer Version: 2 (CONCAWE 2019)	

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

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC13)

PC13	Fuels

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure > 10 Pa. (STP)
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	unless stated differently,Covers use up to (g)	50000
	Covers skin contact area up to (cm2)	420
Frequency and duration of use	unless stated differently,Covers use up to	Uses per day
	Covers exposure up to	2 Hours/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of (m3)	20
	Covers use under typical household ventilation.	
	Fuels,Liquid: Automotive Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 52. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm2. For each use event, covers use amounts up to: 50000 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 0,05. Hours/event
	Fuels,Liquid: Home space heater fuel	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 365. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm2. For each use event, covers use amounts up to: 1500 g. Covers use under typical household ventilation. Covers use in room size of 20 m3. Covers exposure up to 0,03. Hours/event

	Fuels,Liquid, Garden equipment - Use	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 1000 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 2,00. Hours/event
	Fuels,Liquid: Garden equipment - Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 420 cm2. For each use event, covers use amounts up to: 1000 g. Covers use in a one car garage (34m³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,03. Hours/event

Risk management measures

Other risk management measures:

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

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

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	76000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	38
	Maximum daily site tonnage (kg/day)	100
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0,0001
	Release fraction to wastewater from wide dispersive use:	0,00001
	Release fraction to soil from wide dispersive use (regional only):	0,00001

Risk management measures

Conditions and measures related to sewage treatment	Not applicable as there is no release to wastewater	

plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls,Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html),RCRair - Maximum Risk Characterization Ratios for air emissions : EC 265-198-5 = 0,00000098,RCRwater - Maximum Risk Characterization Ratios for wastewater emissions : EC 265-198-5 = 0,00014

1. Exposure scenario 25

Functional fluids

ES Ref.: 25 ES Type: Worker	

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 ERC7 ESVOC SPERC 7.13a.v1
Processes, tasks activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers. Use at industrial sites (IS)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4	Chemical production where opportunity for exposure arises
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS84 - Filling of articles/equipment,CS107 - (closed systems)	No other specific measures identified.	
CS45 - Filling/ preparation of equipment from drums or containers.	No other specific measures identified.	
General exposures (closed systems)	No other specific measures identified.	

CS16 - General exposures (open systems)	No other specific measures identified.	
CS19 - Remanufacture of reject articles	No other specific measures identified.	
CS5 - Equipment maintenance	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC7)

ERC7	Use of functional fluid at industrial site
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	110
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	10
	Maximum daily site tonnage (kg/day)	500
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	20
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	
	Release fraction to wastewater from process (initial release prior to RMM):	
	Release fraction to soil from process (initial release prior to RMM):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,Prevent discharge of undissolved substance to or recover from onsite wastewater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	0
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	22,4
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	7700
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 26

Road and construction applications

ES Ref.: 26 ES Type: Worker	

Use descriptors	PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13 ERC8d, ERC8f ESVOC SPERC 8.15.v1
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. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10	Roller application or brushing
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop,Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
CS8 - Drum/batch transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
Roller application or brushing	No other specific measures identified.	
CS25 - Spraying/ fogging by machine application,Elevated temperature	No other specific measures identified.	
CS4 - Dipping, immersion and pouring	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8d, ERC8f, ESVOC SPERC 8.15.v1)

ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
ESVOC SPERC 8.15.v1	Road and Construction applications: Professional (SU22)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	9
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0045
	Maximum daily site tonnage (kg/day)	0,012
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,19
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

1. Exposure scenario 27

Explosives manufacture & use

ES Ref.: 27 ES Type: Worker	

Use descriptors	PROC1, PROC3, PROC5, PROC8a, PROC8b ERC8e
Processes, tasks activities covered	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning. Widespread use by professional workers (PW)
Assessment method	Used ECETOC TRA model The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC3, PROC5, PROC8a, PROC8b)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product characteristics

Physical form	Liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure 0,5 - 10 kPa at STP

Operational conditions

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

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
General exposures (closed systems)	No other specific measures identified.	
CS14 - Bulk transfers,CS81 - Dedicated facility	No other specific measures identified.	
CS14 - Bulk transfers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS23 - Mixing in containers.	No other specific measures identified.	
CS22 - Transfer from/pouring from containers,CS81 - Dedicated facility	No other specific measures identified.	
CS22 - Transfer from/pouring from containers,CS82 - Non-dedicated facility	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
CS85 - Bulk product storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC8e)

ERC8e	Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
Assessment method	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	0,0025
	Maximum daily site tonnage (kg/day)	0,0068
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	
	Release fraction to wastewater from wide dispersive use:	
	Release fraction to soil from wide dispersive use (regional only):	

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	20,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	0,11
	Assumed domestic sewage treatment plant flow (m^3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

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

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

4.1. Health

Guidance - Health	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects,Risk Management Measures are based on qualitative risk characterisation,Available hazard data do not support the need for a DNEL to be established for other health effects,Users are advised to consider national Occupational Exposure Limits or other equivalent values,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.