



# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

Revision date: 14/05/2020 Supersedes: 13/04/2018 Version: 5.0

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

#### 1.1. Product identifier

Product form	: Mixture
Trade name	: Eni Mix 2T
Product code	: 1401
Type of product	: Lubricants
Formula	: 0003-2005
Product group	: Trade product

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

##### 1.2.1. Relevant identified uses

Main use category	: Industrial use, Professional use, Consumer use
Industrial/Professional use spec	: Wide dispersive use Used in closed systems
Use of the substance/mixture	: Lubricant for two-stroke engines ---- Do not use the product for any purposes that have not been advised by the manufacturer.
Function or use category	: Lubricants and additives

##### 1.2.2. Uses advised against

No additional information available

#### 1.3. Details of the supplier of the safety data sheet

ENI S.p.A.  
P.le E. Mattei 1 - 00144 Rome Italy  
Phone: (+39) 06 59821  
www.eni.com

Contact:  
Refining & Marketing

Competent person responsible for the Safety Data Sheet (Reg. EC nr. 1907/2006): SDSInfo@eni.com

#### 1.4. Emergency telephone number

Emergency number	: CNIT +39 0382 24444 (24h) (IT + EN)
	Poison centre (UK): National Poisons Information Service Edinburgh (24h) (+44) 844 892 0111 0870 600 6266 (UK only) (Source: UN-WHO)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to Regulation (EC) No. 1272/2008 [EU-GHS / CLP]

Hazardous to the aquatic environment — H412  
Chronic Hazard, Category 3  
Full text of H statements : see section 16

##### Adverse physicochemical, human health and environmental effects

Harmful to aquatic life with long lasting effects. For specific information about the toxicological/ecotoxicological properties and classification of this product, see Sect. 11 and/or Sect. 12.

#### 2.2. Label elements

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

CLP Signal word	: [None]
Hazard statements (CLP)	: H412 - Harmful to aquatic life with long lasting effects.
Precautionary statements (CLP)	: P102 - Keep out of reach of children.

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

P273 - Avoid release to the environment.  
P501 - Dispose of contents and container to according to national or local regulations.

### 2.3. Other hazards (not relevant for classification)

Other hazards not contributing to the classification : This product is combustible, but not classified as Flammable. The creation of flammable vapour mixtures takes place at temperatures which are higher than normal ambient levels. In case of contact with eyes, this product may cause irritation. If the product is handled or used at high temperature, contact with hot product or vapours may cause burns. Any substance, in case of accidents involving pressurized circuits and the like, may be accidentally injected under the skin, even without external damage. In such a case, the victim should be brought to an hospital as soon as possible, to get specialized medical treatment. Do not wait for symptoms to develop. In exceptional cases (i.e prolonged storage in tanks contaminated with water, and presence of anaerobic sulfate-reducing microbial colonies), the product may undergo a degradation and generate small amounts of sulfur compounds, including H<sub>2</sub>S.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Notes : Composition/ Information on ingredients:  
Mixture of hydrocarbons  
Acrylic resin  
Additives

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [EU-GHS / CLP]
Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (see note [**], see note [***])	(CAS-No.) 101316-72-7 (EC-No.) 309-877-7 (EC Index-No.) 649-530-00-X (REACH-no) 01-2119489969-06-0000	80 - 90	Not classified
Residual oils (petroleum,) solvent-refined (see note [**], see note [***])	(CAS-No.) 64742-01-4 (EC-No.) 265-101-6 (EC Index-No.) 649-459-00-4 (REACH-no) 01-2119488707-21	10 - 15	Not classified
Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics	(EC-No.) 926-141-6 (EC Index-No.) N/A (REACH-no) 01-2119456620-43	3 - 5	Asp. Tox. 1, H304
Mineral base oil, severely refined (For identification of the substance, see note [*] , see note [***])		1 - 2	Not classified
Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts (Additive, see note [****])	(EC-No.) 939-603-7 (EC Index-No.) N/A (REACH-no) 01-2119978241-36	0,4 - 0,5	Not classified
Phenol, dodecyl-, branched, sulfurized	(CAS-No.) 96152-43-1 (EC-No.) 306-115-5 (EC Index-No.) N/A (REACH-no) 01-2119524001-62	0,1 - 0,2	Repr. 1B, H360F Aquatic Chronic 4, H413
phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched	(CAS-No.) 121158-58-5 (EC-No.) 310-154-3 (EC Index-No.) 604-092-00-9 (REACH-no) 01-2119513207-49	0,1 - 0,15	Skin Corr. 1C, H314 Eye Dam. 1, H318 Repr. 1B, H360F Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410 (M=10)

Notes : [\*] Note: this product may be formulated with one or more of the following severely refined mineral base oils (not classified as hazardous):  
CAS 64742-54-7/EC 265-157-1/REACH Reg. # 01-2119484627-25-xxxx; CAS 64742-65-0/EC 265-169-7/REACH Reg. # 01-2119471299-27-xxxx; CAS 64742-70-7/EC 265-174-4/REACH Reg. # 01-2119487080-42-xxxx.  
All these substances have a value < 3 % wt of DMSO extract, according to IP 346/92 (Nota L - Annex VI Reg (CE) 1272/2008, # 1.1.3)

Note [\*\*]:

this product has a value of DMSO extract < 3 % wt, according to IP 346/92. According to the criteria laid out by the EU (note L, Annex VI of Regulation (CE) 1272/2008), this product must be regarded as non carcinogenic.

Note [\*\*\*]:

substance with occupational exposure limits for some EU countries affecting the category of mineral oils (finely refined mineral base oil mists; see section 8.1)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

Note [\*\*\*\*]:

Total Base Number (TBN): > 300 mgKOH/g (ASTM D 2896)

More detailed information: See section 11.

Full text of H-statements: see section 16

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

- First-aid measures after inhalation : In case of disturbances owing to inhalation of vapours or mists, remove the victim from exposure; keep at rest; if necessary, seek medical attention. See also section 4.3.
- First-aid measures after skin contact : Take off contaminated clothing and shoes. Wash thoroughly with soap and water. If skin irritation occurs: Get medical advice/attention. In case of contact with hot product, cool affected part with plenty of cold water, and cover with gauze or clean cloth. Call a doctor or bring to an hospital. Do not use salves or ointments, unless directed by doctor. Body hypothermia must be avoided. Do not put ice on the burn.
- First-aid measures after eye contact : Rinse eyes thoroughly for at least 15 minutes. Keep eyelids well apart. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist. In case of contact with hot product, cool affected part with plenty of cold water, and cover with gauze or clean cloth. Call a doctor or bring to an hospital. Do not use salves or ointments, unless directed by doctor.
- First-aid measures after ingestion : Do NOT induce vomiting. If the person is conscious, rinse mouth with water without swallowing. Keep at rest. Call for medical assistance or bring to an hospital. If the casualty is unconscious, place in the recovery position. Do not induce vomiting to avoid aspiration into the lungs. If the person is conscious, rinse mouth with water without swallowing. Keep at rest. Call for medical assistance or bring to an hospital. If the casualty is unconscious, place in the recovery position. Do not give anything by mouth to an unconscious person.

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

- Symptoms / injuries (general indications) : Not expected to present a significant hazard under anticipated conditions of normal use.
- Symptoms/effects after inhalation : This product has a low vapour pressure, and in normal conditions at ambient temperature the concentration in the air is negligible. A significant concentration may build up only if the product is used at high temperature, or in case of sprays and mists. In these cases overexposure to vapours may cause irritation to airways, nausea and dizziness.
- Symptoms/effects after skin contact : Contact with hot product may cause thermal burns.
- Symptoms/effects after eye contact : Contact with eyes may cause reddening and irritation. Contact with hot product or vapours may cause burns.
- Symptoms/effects after ingestion : Accidental ingestion of small quantities of the product may cause nausea, discomfort and gastric disturbances.
- Symptoms/effects upon intravenous administration : No information available.
- Chronic symptoms : None to be reported, according to the present classification criteria.

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

Obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve. Seek medical attention in all cases of serious burns. If there is any suspicion of inhalation of H<sub>2</sub>S (hydrogen sulphide), Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures. Send patient to hospital. Immediately begin artificial respiration if breathing has ceased. Administer oxygen if necessary.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

- Suitable extinguishing media : Small-size fires: carbon dioxide, dry chemicals, foam, sand or earth. Large fires: foam or water fog (mist). These means should be used by trained personnel only. Other extinguishing gases (according to regulations).
- Unsuitable extinguishing media : Do not use water jets. They could cause splattering, and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

#### 5.2. Special hazards arising from the substance or mixture

- Fire hazard : This product is combustible, but not classified as Flammable. The creation of flammable vapour mixtures takes place at temperatures which are higher than normal ambient levels.
- Explosion hazard : The vapours are flammable and may form explosive mixtures with air.
- Hazardous decomposition products in case of fire : Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, NO<sub>x</sub>, H<sub>2</sub>S and SO<sub>x</sub> (harmful/toxic gases). Oxygenated compounds (aldehydes, etc.). CaO<sub>x</sub>.

#### 5.3. Advice for firefighters

- Firefighting instructions : Shut off source of product, if possible. Move undamaged containers from immediate hazard area if it can be done safely. Spilled product which is not burning should be covered with sand or foam. Use water sprays to cool containers and surfaces exposed to the flames. If the fire cannot be controlled, evacuate area.

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

- Special protective equipment for firefighters : Personal protection equipment for firefighters (see also sect. 8). In case of a large fire or in confined or poorly ventilated spaces, wear full fire resistant protective clothing and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. EN 443. EN 469. EN 659.
- Other information : In case of fire, do not discharge residual product, waste materials and runoff water: collect separately and use a proper treatment.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Stop or contain leak at the source, if safe to do so. Eliminate all ignition sources if safe to do so (e.g. electricity, sparks, fires, flares). Avoid accidental sprays on hot surfaces or electrical contacts. Avoid direct contact with released material. Keep upwind.

##### 6.1.1. For non-emergency personnel

- Protective equipment : See Section 8.
- Emergency procedures : Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency.

##### 6.1.2. For emergency responders

- Protective equipment : Small spillages: normal antistatic working clothes are usually adequate. Large spillages: full body suit of chemically resistant and antistatic material. If necessary heat resistant and insulated. Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Gloves made of PVA are not water-resistant, and are not suitable for emergency use. If contact with hot product is possible or anticipated, gloves should be heat-resistant and thermally insulated. Antistatic non-skid safety shoes or boots, chemical resistant, if necessary heat resistant and insulated. Work helmet. Goggles and /or face shield, if splashes or contact with eyes is possible or anticipated. Respiratory protection: A half or full-face respirator with filter(s) for organic vapours (A) (or A+B when applicable for H<sub>2</sub>S), or a Self-contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.
- Emergency procedures : Notify local authorities according to relevant regulations.

#### 6.2. Environmental precautions

Do not let the product accumulate in confined or underground spaces. Do not let the product flow into sewers or water courses, or in any way contaminate the environment. In case of contamination of environment compartments (soil, subsoil, surface or underground waters), remove contaminated soil when possible, and in any case treat all involved compartments in accordance with local regulations. The site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

#### 6.3. Methods and material for containment and cleaning up

- For containment : Contain spilled liquid with sand, earth or other suitable absorbents (non-flammable). Recover free liquid and waste materials in suitable waterproof and oil-resistant containers. Clean contaminated area. Dispose of according to local regulations. If in water: Confine the spillage. Remove from surface by skimming or suitable floating absorbents. Collect recovered product and other waste materials in suitable waterproof, oil resistant containers. Recover or dispose of according to local regulations. Do not use solvents or dispersants, unless specifically advised by an expert, and, if required, approved by local authorities.
- Other information : Recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air/water temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. Local regulations may also prescribe or limit actions to be taken. For this reason, local experts should be consulted when necessary.

#### 6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

- Precautions for safe handling : This material is combustible, but will not ignite readily. Provide adequate ventilation. Use adequate personal protective equipment as needed. Due to the extremely slippery nature of this material, more care than usual must be exercised in material handling practices to keep off all walking surfaces. Floors, walls and other surfaces in the hazard area must be cleaned regularly. Avoid release to the environment. Emptied containers can contain combustible product residues. Do not cut, weld, drill, burn or incinerate empty containers or drums, unless they have been drained and cleaned. The 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. Before entering storage tanks and commencing any operation in a confined area (e.g. tunnels), carry out an adequate clean-up, and check the atmosphere for oxygen content, flammability, and the presence of sulphur compounds. See also Section 16, "Other information".

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

**Hygiene measures** : Ensure that proper housekeeping measures are in place. Avoid contact with skin. Do not breathe fume/ mist/ vapours. Do not ingest. Do not smoke. Do not eat and do not drink during use. Do not clean hands with dirty or oil-soaked rags. Do not re-use clothes, if they are still contaminated. Keep away from food and beverages. Take off immediately all contaminated clothing and wash it before reuse. Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

### 7.2. Conditions for safe storage, including any incompatibilities

**Storage conditions** : Store in dry, well ventilated area. Keep away from open flames, hot surfaces and sources of ignition. Do not smoke.

**Incompatible products** : Keep away from: strong oxidants.

**Storage area** : Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills. Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.

**Packages and containers:** : If the product is supplied in containers: Keep containers tightly closed and properly labelled. Keep only in the original container or in a suitable container for this kind of product.

**Packaging materials** : For containers, or container linings use materials specifically approved for use with this product. Compatibility should be checked with the manufacturer.

### 7.3. Specific end use(s)

No information available.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)		
Austria	MAK (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Belgium	Limit value (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Denmark	Grænseværdi (langvarig) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Denmark	Grænseværdi (kortvarig) (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Hungary	AK-érték	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Netherlands	MAC TGG 8h (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Spain	VLA-ED (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Spain	VLA-EC (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Sweden	Nivågränsvärde (NVG) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Sweden	Kortidsvärde (KTV) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
United Kingdom	WEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
United Kingdom	WEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Canada (Quebec)	VECD (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Canada (Quebec)	VEMP (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - ACGIH	ACGIH TLV®-TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - ACGIH	ACGIH TLV®-STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - NIOSH	NIOSH REL (STEL) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

<b>Residual oils (petroleum,) solvent-refined (64742-01-4)</b>		
Austria	MAK (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Belgium	Limit value (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Denmark	Grænseværdi (langvarig) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Denmark	Grænseværdi (kortvarig) (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Hungary	AK-érték	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Netherlands	MAC TGG 8h (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Spain	VLA-ED (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Spain	VLA-EC (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Sweden	Nivågränsvärde (NVG) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Sweden	Kortidsvärde (KTV) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
United Kingdom	WEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
United Kingdom	WEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - ACGIH	ACGIH TLV®-TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - ACGIH	ACGIH TLV®-STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
<b>Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics &lt; 2% aromatics</b>		
Germany	Occupational exposure limit value (mg/m <sup>3</sup> )	350 mg/m <sup>3</sup>
Germany	Occupational exposure limit value (ppm)	50 ppm
Germany	Limitation of exposure peaks (mg/m <sup>3</sup> )	700 mg/m <sup>3</sup>
Germany	Limitation of exposure peaks (ppm)	100 ppm
Switzerland	MAK (mg/m <sup>3</sup> )	350 mg/m <sup>3</sup>
Switzerland	VLE (mg/m <sup>3</sup> )	700 mg/m <sup>3</sup>
<b>Mineral base oil, severely refined</b>		
Austria	MAK (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Belgium	Limit value (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Denmark	Grænseværdi (langvarig) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Denmark	Grænseværdi (kortvarig) (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Hungary	AK-érték	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Netherlands	MAC TGG 8h (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Spain	VLA-ED (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Spain	VLA-EC (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Sweden	Nivågränsvärde (NVG) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Sweden	Kortidsvärde (KTV) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
United Kingdom	WEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
United Kingdom	WEL STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

<b>Mineral base oil, severely refined</b>		
Canada (Quebec)	VECD (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
Canada (Quebec)	VEMP (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - ACGIH	ACGIH TLV®-TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - ACGIH	ACGIH TLV®-STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - NIOSH	NIOSH REL (STEL) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)
USA - OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (Mineral base oil mist, severely refined, DMSO extract <3% m/m)

### Monitoring methods

Monitoring methods	Monitoring procedures should be chosen according to the indications set by national authorities or labour contracts, Refer to relevant legislation and in any case to the good practice of industrial hygiene.
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### Eni Mix 2T

#### DNEL/DMEL (additional information)

Additional information Not applicable

#### PNEC (additional information)

Additional information Not applicable

### Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)

#### DNEL/DMEL (Workers)

Long-term - systemic effects, dermal 1 mg/kg bodyweight/day

Long-term - systemic effects, inhalation 2,7 mg/m<sup>3</sup>

Long-term - local effects, inhalation 5,6 mg/m<sup>3</sup>

#### DNEL/DMEL (General population)

Long-term - systemic effects, oral 0,74 mg/kg bodyweight/day

#### PNEC (Oral)

PNEC oral (secondary poisoning) 9,33 mg/kg food

### Residual oils (petroleum,) solvent-refined (64742-01-4)

#### DNEL/DMEL (Workers)

Long-term - systemic effects, dermal 0,97 mg/kg bodyweight/day

Long-term - systemic effects, inhalation 2,73 mg/m<sup>3</sup>

Long-term - local effects, inhalation 5,58 mg/m<sup>3</sup>

#### DNEL/DMEL (General population)

Long-term - systemic effects, oral 0,74 mg/kg bodyweight/day

Long-term - local effects, inhalation 1,19 mg/m<sup>3</sup>

#### PNEC (Oral)

PNEC oral (secondary poisoning) 9,33 mg/kg food

### Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics

#### DNEL/DMEL (additional information)

Additional information No-threshold effect and/or no dose-response information available

#### PNEC (additional information)

Additional information Not derived - Not classified as hazardous for environment

### Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts

#### DNEL/DMEL (Workers)

Acute - local effects, dermal 1,04 mg/cm<sup>2</sup>

Long-term - systemic effects, dermal 25 mg/kg bodyweight/day

Long-term - systemic effects, inhalation 35,26 mg/m<sup>3</sup>

#### DNEL/DMEL (General population)

Acute - local effects, dermal 0,518 mg/cm<sup>2</sup>

Long-term - systemic effects, oral 2,5 mg/kg bodyweight/day

Long-term - systemic effects, inhalation 8,7 mg/m<sup>3</sup>

Long-term - systemic effects, dermal 12,5 mg/kg bodyweight/day

#### PNEC (Water)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

<b>Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts</b>	
PNEC aqua (freshwater)	0,1 mg/l
PNEC aqua (marine water)	0,1 mg/l
PNEC aqua (intermittent, freshwater)	1 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	45211 mg/kg dwt
PNEC sediment (marine water)	45211 mg/kg dwt
PNEC (Soil)	
PNEC soil	47025 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	1000 mg/l
<b>Phenol, dodecyl-, branched, sulfurized (96152-43-1)</b>	
DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	80 mg/kg bodyweight/day
Acute - systemic effects, inhalation	66,8 mg/m <sup>3</sup>
Long-term - systemic effects, dermal	3,12 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	3,526 mg/m <sup>3</sup>
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	40 mg/kg bodyweight
Acute - systemic effects, inhalation	66,8 mg/m <sup>3</sup>
Acute - systemic effects, oral	25 mg/kg bodyweight
Long-term - systemic effects, oral	0,25 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	0,87 mg/m <sup>3</sup>
Long-term - systemic effects, dermal	1,56 mg/kg bodyweight/day
PNEC (Water)	
PNEC aqua (freshwater)	250 µg/l
PNEC aqua (marine water)	24 µg/l
PNEC aqua (intermittent, freshwater)	2,5 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	0,223 mg/kg dwt
PNEC sediment (marine water)	0,021 mg/kg dwt
PNEC (Soil)	
PNEC soil	260,04 mg/kg dwt
PNEC (Oral)	
PNEC oral (secondary poisoning)	6,67 mg/kg food
PNEC (STP)	
PNEC sewage treatment plant	6,5 mg/l
<b>phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched (121158-58-5)</b>	
DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	166 mg/kg bodyweight/day
Acute - systemic effects, inhalation	44,18 mg/m <sup>3</sup>
Long-term - systemic effects, dermal	0,25 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	1,762 mg/m <sup>3</sup>
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	50 mg/kg bodyweight
Acute - systemic effects, inhalation	13,26 mg/m <sup>3</sup>
Acute - systemic effects, oral	1,26 mg/kg bodyweight
Long-term - systemic effects, oral	0,075 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	0,79 mg/m <sup>3</sup>
Long-term - systemic effects, dermal	0,075 mg/kg bodyweight/day
PNEC (Water)	
PNEC aqua (freshwater)	0,074 µg/l
PNEC aqua (marine water)	0,0074 µg/l
PNEC aqua (intermittent, freshwater)	0,37 µg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	0,226 mg/kg dwt
PNEC sediment (marine water)	0,0266 mg/kg dwt
PNEC (Soil)	
PNEC soil	118 µg/kg dw



# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched (121158-58-5)	
PNEC (Oral)	
PNEC oral (secondary poisoning)	4 mg/kg food
PNEC (STP)	
PNEC sewage treatment plant	100 mg/l

Note : The Derived No Effect Level (DNEL) is an estimated safe level of exposure that is derived from toxicity data in accord with specific guidance within the European REACH regulation. The DNEL may differ from an Occupational Exposure Limit (OEL) for the same chemical. OELs may be recommended by an individual company, a governmental regulatory body or an expert organization, such as the Scientific Committee for Occupational Exposure Limits (SCOEL) or the American Conference of Governmental Industrial Hygienists (ACGIH). OELs are considered to be safe exposure levels for a typical worker in an occupational setting for an 8-hour work shift, 40 hour work week, as a time weighted average (TWA) or a 15 minute short-term exposure limit (STEL). While also considered to be protective of health, OELs are derived by a process different from that of REACH.

### 8.2. Exposure controls

#### Appropriate engineering controls:

Ensure that there is a suitable ventilation system. Before entering storage tanks and commencing any operation in a confined area, carry out an adequate clean-up, and check the atmosphere for oxygen content, flammability, and the presence of sulphur compounds. See also Section 16, "Other information".

#### Personal protective equipment (for industrial or professional use):

Face shield. Gloves. Protective clothing. Safety glasses. Safety shoes or boots. Dust/aerosol mask.

#### Hand protection:

When there is a risk of contact with the skin, use hydrocarbon-resistant, felt-lined gloves. Adequate materials: nitrile (NBR) or PVC with a protection index > 5 (permeation time > 240 mins). Use gloves respecting all the conditions and within the limits set by the manufacturer. Replace gloves immediately in case of cuts, holes or other signs of damages or degradation. If necessary, refer to the EN 374 standard. Personal hygiene is a key element for an effective hand care. Gloves must be worn only with clean hands. After wearing gloves, hands must be carefully washed and dried.

#### Eye protection:

When there is a risk of contact with the eyes, use safety goggles or other means of protection (face shield). If necessary, refer to national standards or to the EN 166 standard.

#### Skin and body protection:

Long-sleeved overalls. If necessary, refer to the EN 340 and related standards, for definition of characteristics and performance according to the risk rating of the area. Antistatic non-skid safety shoes or boots, chemical resistant, if necessary heat resistant and insulated.

#### Respiratory protection:

Independently from other possible actions (technical modifications, operating procedures, and other means to limit the exposure of workers), personal protection equipment can be used according to necessity. Open or well ventilated spaces: in presence of oil mists and if the product is handled without adequate containment means: use full or half-face masks with filter for mists/aerosols. In case there is a significant presence of vapours (e.g. through handling at high temperature), use full or half-face masks with filter for hydrocarbon vapours. (EN 136/140/145). Combination filter device (DIN EN 141). Closed or confined areas (e.g. tank interiors): the use of protection measures for airways (masks or self-contained breathing apparatus), must be assessed according to the specific activity, as well as level and duration of predicted exposure. (EN 136/140/145). Approved respiratory protection equipment shall be used in spaces where hydrogen sulphide may accumulate: full face mask with cartridge/filter type "B" (grey for inorganic vapours including H<sub>2</sub>S) or self-contained breathing apparatus (SCBA). (EN 136/140/145)

#### Personal protective equipment symbol(s):



#### Thermal hazard protection:

If contact with hot product is possible or anticipated, gloves should be heat-resistant and thermally insulated.

#### Environmental exposure controls:

Do not discharge the product into the environment. Storage areas/installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills. Prevent discharge of undissolved substance to or recover from onsite wastewater. Onsite wastewater treatment required. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

#### Consumer exposure controls:

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

No special requirements necessary, if handled at room temperature.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid, bright & clear.
Colour	: Yellow-brown.
Odour	: Slight odour of petroleum.
Odour threshold	: There are no data available on the preparation/mixture itself.
pH	: Not applicable.
Relative evaporation rate (butylacetate=1)	: Negligible.
Melting point	: -28 °C (pour point) (ASTM D 97)
Freezing point	: ≈ 0 °C (CAS 101316-72-7)
Boiling point	: > 250 °C (CAS 101316-72-7)
Flash point	: 111 °C (ASTM D 93)
Critical temperature	: Not applicable for mixtures
Auto-ignition temperature	: > 300 °C (CAS 101316-72-7)
Decomposition temperature	: No data available
Flammability (solid, gas)	: Not applicable
Vapour pressure	: < 0,1 hPa (20°C, CAS 101316-72-7)
Critical pressure	: Not applicable for mixtures
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Density	: 871 kg/m <sup>3</sup> (15 °C) (ASTM D 4052)
Solubility	: Water: Immiscible and insoluble
Log Pow	: Not applicable for mixtures
Log Kow	: Not applicable for mixtures
Viscosity, kinematic	: 62 mm <sup>2</sup> /s (40 °C) (ASTM D 445)
Viscosity, dynamic	: No data available
Explosive properties	: None (according to composition).
Oxidising properties	: None (according to composition).
Explosive limits	: Not applicable

#### 9.2. Other information

Additional information : No data available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

This mixture does not offer any further hazard for reactivity, except what is reported in the following paragraphs.

#### 10.2. Chemical stability

Stable product, according to its intrinsic properties (in normal conditions of storage and handling).

#### 10.3. Possibility of hazardous reactions

None (in normal conditions of storage and handling). Contact with strong oxidizers (peroxides, chromates, etc.) may cause a fire hazard. Sensitivity to heat, friction or shock cannot be assessed in advance.

#### 10.4. Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition.

#### 10.5. Incompatible materials

Strong oxidants.

#### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition generates : Carbon dioxide, Carbon monoxide, Toxic fumes. In exceptional cases (i.e prolonged storage in tanks contaminated with water, and presence of anaerobic sulfate-reducing microbial colonies), the product may undergo a degradation and generate small amounts of sulfur compounds, including H<sub>2</sub>S. See also Section 16, "Other information".

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

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

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

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)
Additional information	: (according to composition)

<b>Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)</b>	
LD50 oral rat	> 5000 mg/kg (API 1986, UBTL 1983 - OECD 401)
LD50 dermal rabbit	> 2000 mg/kg bodyweight (API 1986, UBTL 1984 - OECD 402)
LC50 inhalation rat (mg/l)	2,18 - 5,53 mg/l/4h (API 1987, Exxon Biomedical Sciences, Inc. 1988, BioResearch Laboratories, Ltd. 1984 - OECD 403)

<b>Residual oils (petroleum,) solvent-refined (64742-01-4)</b>	
LD50 oral rat	5000 mg/kg bodyweight
LD50 dermal rat	2000 - 5000 mg/kg bodyweight
LC50 inhalation rat (mg/l)	2,18 - 5,53 mg/l/4h

<b>Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics &lt; 2% aromatics</b>	
LD50 oral rat	5000 - 15000 mg/kg bodyweight (OECD 401; ExxonMobil, 1989)
LD50 dermal rat	≥ 2000 mg/kg bodyweight (OECD 402; CEPESA Quimica, 1989)
LD50 dermal rabbit	3160 - 5000 mg/kg bodyweight (OECD 402; ExxonMobil, 1984)
LC50 inhalation rat (mg/l)	5000 - 11000 mg/m <sup>3</sup> (OECD 403) (Read across: C11-C13, < 2% arom; ExxonMobil, 2005)

<b>Mineral base oil, severely refined</b>	
LD50 oral rat	> 5000 mg/kg bodyweight (OECD 401)
LD50 dermal rat	> 5000 mg/kg bodyweight (OECD 402)
LC50 inhalation rat (mg/l)	> 5 mg/l/4h (OECD 403)

<b>Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts</b>	
LD50 oral rat	> 5000 mg/kg bodyweight ((Sanitised, F. (1989), OECD Guideline 401))
LD50 dermal rat	> 2000 mg/kg bodyweight ((Sanitised, G. (1989), OECD Guideline 402))
LC50 inhalation rat (mg/l)	> 1,9 mg/l/4h ((Hoffman, G.M. (1986), EPA OPP 81-3))

<b>Phenol, dodecyl-, branched, sulfurized (96152-43-1)</b>	
LD50 oral rat	≥ 5000 mg/kg bodyweight (OECD 401) (Read-across)
LD50 dermal rabbit	≥ 4000 mg/kg bodyweight (OECD 402) (Read-across)

<b>phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched (121158-58-5)</b>	
LD50 oral rat	2100 - 2200 mg/kg bodyweight
LD50 dermal rabbit	15000 mg/kg bodyweight

Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met) pH: Not applicable.
Additional information	: (according to composition)
Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met) pH: Not applicable.
Additional information	: (according to composition)
Respiratory or skin sensitisation	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: (according to composition) This product is formulated with one or more ingredients (complex additive mixtures) which contains calcium sulfonates. All these ingredients have each a TBN value > 300 mg KOH/g, therefore they are not classified as sensitizers. Total Base Number (TBN): > 300 mgKOH/g (ASTM D 2896) On basis of test data: not sensitising.
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: (according to composition)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

Additional information	: (according to composition) This product contains : Lubricating oils (petroleum), C24-50, solvent-extd, dewaxed, hydrogenated; Baseoil— unspecified; [A complex combination of hydrocarbons obtained by solvent extraction and hydrogenation of atmospheric distillation residues. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C24 through C50 and produces a finished oil with a viscosity in the order of 16cSt to 75cSt at 40 °C (104 °F).], Residual oils (petroleum) solvent-refined; Baseoil— unspecified; [A complex combination by hydrocarbons obtained as the solvent insoluble fraction from solvent refining of a residuum using a polar organic solvent such as phenol or furfural. It consists of hydrocarbons having carbon numbers predominantly higher than C25 and boiling above approximately 400°C (752°F).] this product has a value of DMSO extract < 3 % wt, according to IP 346/92. According to the criteria laid out by the EU (note L, Annex VI of Regulation (CE) 1272/2008), this product must be regarded as non carcinogenic. All the mineral base oils contained in this product have a value < 3 % wt of DMSO extract, according to IP 346/92 (Nota L - Annex VI Reg (CE) 1272/2008, # 1.1.3) No carcinogenic effect
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Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics	
NOAEL (chronic, oral, animal/male, 2 years)	138 mg/m <sup>3</sup> (NOAEC - OECD 453) (Read across: Stoddard solvent; NTP, 2004)
NOAEL (chronic, oral, animal/female, 2 years)	> 2200 mg/m <sup>3</sup> (NOAEC - OECD 453) (Read across: Stoddard solvent; NTP, 2004)

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

Additional information	: (according to composition) This product contains an UVCB substance (Dodecylphenol, branched, sulfurized) classified as Repr. 1B, H360F according to the criteria of EU This product contains, as impurity, a substance (Dodecylphenol, branched) classified as Repr. 1B, H360F (CLP) according to the criteria of EU May damage fertility.
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Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics	
NOAEC (PO), Inhalation, rat, local	≥ 1720 mg/m <sup>3</sup> (5 days/week, for 8 weeks, (OECD 421), (ExxonMobil 1980))

phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched (121158-58-5)	
NOAEL (animal/male, F1)	1,5 mg/kg
NOAEL (animal/female, F1)	15 mg/kg (OECD 416)

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

Additional information : (according to composition)

Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts	
NOAEL (dermal, rat/rabbit)	2500 mg/kg bodyweight
NOAEC (inhalation, rat, vapour)	881,58 mg/m <sup>3</sup>

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

Additional information : (according to composition)

Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)	
LOAEL (oral, rat, 90 days)	125 mg/kg bodyweight/day (Mobil 1990 - OECD TG 408)
LOAEL (dermal, rat/rabbit, 90 days)	100 mg/kg bodyweight/day (mouse, Chasey, K.L. and McKee, R.H. 1993 - OECD 453)
NOAEL (dermal, rat/rabbit, 90 days)	1000 - 2000 mg/kg bodyweight/day (API 1986, Mobil Environmental and Health Science Laboratory 1983 - OECD 410)
NOAEC (inhalation, rat, vapour, 90 days)	220 - 1500 mg/m <sup>3</sup> (Exxon Biomedical Sciences, Inc. 1991, Dalbey W, Osimitz T, Kommineni C, Roy T, Feuston M and Yang J 1991 - OECD 412)

Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics	
NOAEL (oral, rat, 90 days)	1000 - 5000 mg/kg bodyweight/day (OECD 408, Sasol, 1995 - ExxonMobil 1991)
NOAEC (inhalation, rat, dust/mist/fume, 90 days)	2200 - 10400 mg/l air (OECD 413 - OECD 453, National Toxicology Program 2006 - Shell, 1980)

Mineral base oil, severely refined	
LOAEL (oral, rat, 90 days)	125 mg/kg bodyweight/day (OECD TG 408)

Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts	
NOAEL (dermal, rat/rabbit, 90 days)	> 1000 (OECD Guideline 410)
NOAEL (subacute, oral, animal/male, 28 days)	> 500 mg/kg bodyweight (OECD Guideline 407)

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

Additional information : (according to composition)  
Viscosity, kinematic: > 20,5 mm<sup>2</sup>/s (40 °C) (ASTM D 445)

Eni Mix 2T	
Viscosity, kinematic	62 mm <sup>2</sup> /s (40 °C) (ASTM D 445)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

Potential adverse human health effects and symptoms	: Contact with eyes may cause reddening and irritation. Avoid all eye and skin contact and do not breathe vapour and mist.
Other information	: None.

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general	: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. An uncontrolled release to the environment may produce a contamination of different environmental compartments (air, soil, underground, surface water bodies, aquifers). Handle according to general working hygiene practices to avoid pollution and release into the environment. Notify authorities if product enters sewers or public waters.
Ecology - air	: This product has a low vapour pressure. A significant exposure may happen only if the product is used at high temperature, or in case of sprays and mists.
Ecology - water	: This product is not soluble in water. It floats on water and forms a film on the surface. The damage to aquatic organisms is of mechanical kind (immobilization and entrapment)
Ecology - water	: Harmful to aquatic life.
Hazardous to the aquatic environment, short-term (acute)	: Not classified (Based on available data, the classification criteria are not met)
Hazardous to the aquatic environment, long-term (chronic)	: Harmful to aquatic life with long lasting effects.

Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)	
LC50 fish 1	> 100 mg/l (LL 50, Exxon 1995 - OECD 203)
EC50 Daphnia 1	> 10000 mg/l (WAF, 48 h, Shell 1988 - OECD 202)
NOEC (acute)	>= 100 mg/l (Pseudokirchneriella subcapitata, 72h, OECD 201 - Petro-Canada 2008)
NOEC chronic fish	>= 1000 mg/l (Oncorhynchus mykiss, NOELR, 14d - QSAR, Redman, A. et al. 2010)
NOEC chronic crustacea	>= 1000 mg/l (21d, OECD 211 - Shell 1994)

Residual oils (petroleum,) solvent-refined (64742-01-4)	
LC50 fish 1	100 mg/l
EC50 Daphnia 1	10 g/l

Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics less 2% aromatics	
LC50 fish 1	≥ 1000 mg/l LL50, 72 h (Oncorhynchus mykiss, OECD 203) (QSAR, CONCAWE 2010)
EC50 Daphnia 1	≥ 1000 mg/l EL50, 48 h (OECD 202) (SRC, 1994)
EC50 other aquatic organisms 1	≥ 10000 mg/l LL50, 48 h (Chaetogammarus marinus, OECD 202) (TNO, 1991)
ErC50 (algae)	≥ 1000 mg/l EL50, 72 h (Pseudokirchneriella subcapitata, OECD 201) (SRC, 1994)
NOEC (acute)	1000 mg/l NOELR, 72 h (Pseudokirchnerella subcapitata, OECD 201) (SRC, 1994)
NOEC chronic fish	0,173 mg/l (NOELR, 28d, QSAR, CONCAWE 2010)
NOEC chronic crustacea	1,22 mg/l (NOELR, 21d, QSAR, CONCAWE 2010)

Mineral base oil, severely refined	
LC50 fish 1	> 100 mg/l (LL 50)
EC50 Daphnia 1	> 10000 mg/l WAF, 48 h (OECD 202)

Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts	
LC50 fish 1	≥ 100 mg/l LL50/96h, OECD 203 (WAF) (Read-across) - Oncorhynchus mykiss - Goodband, T.J. (2005a)
LC50 fish 2	≥ 10000 mg/l LL50/96h, OECD 203 (WAF) (Read-across) - Cyprinodon variegatus - Nicholson, R.B. (1986)
EC50 Daphnia 1	≥ 1000 mg/l EC50/48h, EPA OTS 797.1300 (WAF) (Read-across) - Ward, T.J (1993)
EC50 72h algae (1)	≥ 100 mg/l LL50/96h, OECD 201 (WAF) (Read-across) - Scenedesmus subspicatus - Mead, C. (2005)
ErC50 (algae)	≥ 1000 mg/l EC50/72h, EPA OTS 797.1050 (WAF) (Read-across) - Pseudokirchnerella subcapitata - Ward, T.J (1994)

Phenol, dodecyl-, branched, sulfurized (96152-43-1)	
LC50 fish 1	≥ 500 mg/l (LL50 - 96h)
EC50 Daphnia 1	≥ 750 mg/l (LL50 - 96h)

Dodecylphenol, mixed isomers, branched (121158-58-5)	
LC50 fish 1	40 mg/l (Pimephales promelas)
EC50 Daphnia 1	37 - 92,7 µg/l
EC50 Daphnia 2	0,037 mg/l
EC50 other aquatic organisms 1	> 0,58 mg/l (96h, Mysidopsis Bahia)
EC50 72h algae (1)	0,36 mg/l
ErC50 (algae)	0,36 mg/l (21d)

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

<b>Dodecylphenol, mixed isomers, branched (121158-58-5)</b>	
NOEC (chronic)	0,0037 mg/l (21d)

### 12.2. Persistence and degradability

<b>Eni Mix 2T</b>	
Persistence and degradability	The most significant constituents of the product should be considered as "inherently biodegradable", but not "readily biodegradable", and they may be moderately persistent, particularly in anaerobic conditions.

<b>Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)</b>	
Persistence and degradability	The most significant constituents of the product should be considered as "inherently biodegradable", but not "readily biodegradable", and they may be moderately persistent, particularly in anaerobic conditions.

<b>Residual oils (petroleum,) solvent-refined (64742-01-4)</b>	
Persistence and degradability	Substance is complex UVCB. The test methods for this endpoint are not applicable to UVCB substances.

<b>Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics less 2% aromatics</b>	
Persistence and degradability	The most significant constituents of the product should be considered as "readily biodegradable".
Biodegradation	77 - 83 % 28 d (OECD 301 F) (Shell, 1997)

<b>Mineral base oil, severely refined</b>	
Persistence and degradability	The most significant constituents of the product should be considered as "inherently biodegradable", but not "readily biodegradable", and they may be moderately persistent, particularly in anaerobic conditions.

<b>Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts</b>	
Persistence and degradability	Not readily biodegradable.
Biodegradation	8 % (28d - OECD Guideline 301 D)

<b>Phenol, dodecyl-, branched, sulfurized (96152-43-1)</b>	
Biodegradation	13,4 % (28d)

<b>Dodecylphenol, mixed isomers, branched (121158-58-5)</b>	
Biodegradation	25 % (28 d, OECD TG 301 B)

### 12.3. Bioaccumulative potential

<b>Eni Mix 2T</b>	
Log Pow	Not applicable for mixtures
Log Kow	Not applicable for mixtures
Bioaccumulative potential	Not established.

<b>Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)</b>	
Bioaccumulative potential	The test methods for this endpoint are not applicable to UVCB substances.

<b>Residual oils (petroleum,) solvent-refined (64742-01-4)</b>	
Bioaccumulative potential	The test methods for this endpoint are not applicable to UVCB substances.

<b>Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics less 2% aromatics</b>	
Log Pow	Not applicable (UVCB)
Log Kow	Not applicable (UVCB)
Bioaccumulative potential	The test methods for this endpoint are not applicable to UVCB substances.

<b>Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts</b>	
BCF fish 1	70,8 (L/Kg w/w)
Log Pow	6,91
Log Kow	8 (OECD Guideline 107 (EU Method A.8))

<b>Dodecylphenol, mixed isomers, branched (121158-58-5)</b>	
Bioconcentration factor (BCF REACH)	794,33
Log Kow	7,14

### 12.4. Mobility in soil

<b>Eni Mix 2T</b>	
Ecology - soil	No data available.

<b>Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)</b>	
Ecology - soil	The test methods for this endpoint are not applicable to UVCB substances.

<b>Residual oils (petroleum,) solvent-refined (64742-01-4)</b>	
Ecology - soil	The test methods for this endpoint are not applicable to UVCB substances.

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics less 2% aromatics	
Surface tension	24 - 29 mN/m (20°C)
Log Koc	4,16 - 5,88
Ecology - soil	The test methods for this endpoint are not applicable to UVCB substances.

Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts	
Log Koc	15,65 - 15,75 (QSAR, Chemservice S.A. (2013a))

### 12.5. Results of PBT and vPvB assessment

Eni Mix 2T	
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII	
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII	
Results of PBT-vPvB assessment	The components in this formulation do not meet the criteria for classification as PBT or vPvB. The product should be considered prudentially as "Persistent" in the environment, according to the REACH Annex XIII criteria (point 1.1)

Component	
Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated (101316-72-7)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII This substance does not meet the criteria for classification as PBT or vPvB. The product should be considered prudentially as "Persistent" in the environment, according to the REACH Annex XIII criteria (point 1.1)
Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics less 2% aromatics ()	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII This substance does not meet the criteria for classification as PBT or vPvB.
Mineral base oil, severely refined ()	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII This substance does not meet the criteria for classification as PBT or vPvB. The product should be considered prudentially as "Persistent" in the environment, according to the REACH Annex XIII criteria (point 1.1)
Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts ()	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII This substance does not meet the criteria for classification as PBT or vPvB. The product should be considered prudentially as "Persistent" in the environment, according to the REACH Annex XIII criteria (point 1.1)
Residual oils (petroleum,) solvent-refined (64742-01-4)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

### 12.6. Other adverse effects

Other adverse effects	: None.
Additional information	: This product has no specific properties for inhibition of bacterial activity. In any case, wastewater containing this product should be treated in plants that are suited for the specific purpose.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods	: Do not dispose of the product, either new or used, by discharging into sewers, tunnels, lakes or water courses. Deliver to a qualified official collector. Dispose of empty containers and wastes safely.
Sewage disposal recommendations	: Dispose of in a safe manner in accordance with local/national regulations. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Product/Packaging disposal recommendations	: European Waste Catalogue code(s) (Decision 2001/118/CE): 13 02 05* (mineral-based non-chlorinated engine, gear and lubricating oils). This EWC code is only a general indication, and takes into account the original composition of the product and its intended use. The user has the responsibility of choosing the right EWC code, considering the actual use of the product, alterations and contaminations.
Additional information	: Empty containers may contain combustible product residues. Do not cut, weld, drill, burn or incinerate empty containers or drums, unless they have been cleaned, and declared safe.
Ecology - waste materials	: The product as it is does not contain halogenated substances.
EURAL code (EWC)	: 13 02 05* - Mineral-based non-chlorinated engine, gear and lubricating oils

## SECTION 14: Transport information

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

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN number</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>14.2. UN proper shipping name</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

ADR	IMDG	IATA	ADN	RID
<b>14.3. Transport hazard class(es)</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>14.4. Packing group</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>14.5. Environmental hazards</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
None.				

### 14.6. Special precautions for user

#### - Overland transport

Not regulated

#### - Transport by sea

Not regulated

#### - Air transport

Not regulated

#### - Inland waterway transport

Not regulated

#### - Rail transport

Not regulated

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

IBC code : Not applicable.

## SECTION 15: Regulatory information

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

#### 15.1.1. EU-Regulations

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

3(b) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics - Phenol, dodecyl-, branched, sulfurized - phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched
3(c) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1	Eni Mix 2T - Phenol, dodecyl-, branched, sulfurized - phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched
30. Substances which are classified as reproductive toxicant category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 5 or Appendix 6, respectively.	phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched

No ingredients are included in the REACH Candidate list (> 0,1 % m/m).

Contains no REACH Annex XIV substances

Other information, restriction and prohibition regulations : Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). (et sequens). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (et sequens). Directives 89/391/CEE, 89/654/CEE, 89/655/CEE, 89/656/CEE, 90/269/CEE, 90/270/CEE, 90/394/CEE, 90/679/CEE, 93/88/CEE, 95/63/CE, 97/42/CE, 98/24/CE, 99/38/CE, 99/92/CE, 2001/45/CE, 2003/10/CE, 2003/18/CE (Health and safety on the workplace). Directive 2012/18/CE (Control of major-accident hazards involving dangerous substances). Directive 2004/42/CE (Limitation of emissions of Volatile Organic Compounds). Directive 98/24/EC (protection of the health and safety of workers from the risks related to chemical agents at work). Directive 92/85/CE (measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding). Substances Depleting the Ozone layer (1005/2009) - Annex I Substances (ODP). Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC. Regulation EU (649/2012) - Export and Import of hazardous chemicals (PIC).



# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

### 15.1.2. National regulations

National adoption of EU Directives concerning health and safety on the workplace.  
National adoption of EU Directives concerning control of major-accident hazards involving dangerous substances (2012/18/CE).  
Relevant national laws on prevention of water pollution.  
Relevant national laws on protection of the health of pregnant workers (National adoption of Dir. 92/85/EEC).  
National adoption of Directives 75/439/CEE - 87/101/CEE concerning disposal of used oils.

#### France

Maladies professionnelles (F) : RG 36 - Affections provoquées par les huiles et graisses d'origine minérale ou de synthèse

#### Germany

Reference to AwSV : Water hazard class (WGK) (D) 1, Slightly hazardous to water (Classification according to AwSV, Annex 1)

WGK remark : Classification based on the components in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS)

VbF class (D) : Not applicable.

Storage class (LGK) (D) : LGK 10 - Combustible liquids

Employment restrictions : Employment prohibitions or restrictions on the protection of young people at work according to § 22 JArbSchG in the case of formation of hazardous substances have to be observed.

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Other information, restrictions and prohibition regulations : TRGS 400: Hazard assessment for activities involving Hazardous Substances  
TRGS 401: Risks resulting from skin contact - identification, assessment, measures  
TRGS 402: Identification and Assessment of the Risks from Activities involving Hazardous Substances: Inhalation Exposure  
TRGS 555: Working instruction and information for workers  
TRGS 800: Fire protection measures  
TRGS 900: Occupational Exposure Limits

#### Netherlands

Waterbezuwaarlijkheid : 8 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment  
9 - Harmful to aquatic organisms

Saneringsinspanningen : C - Minimize discharge

SZW-lijst van kankerverwekkende stoffen : None of the components are listed

SZW-lijst van mutagene stoffen : None of the components are listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : None of the components are listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : Dodecylphenol, mixed isomers, branched is listed

#### Denmark

Danish National Regulations : Pregnant/breastfeeding women working with the product must not be in direct contact with it  
The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

### 15.2. Chemical safety assessment

For this mixture a chemical safety assessment has been not carried out

#### A chemical safety assessment has been carried out for the following components of this mixture:

Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated  
Hydrocarbons, C11-C14, n-alkanes, iso-alkanes, cyclics < 2% aromatics  
Benzenesulfonic acid, di-C10-14-alkyl derivs., calcium salts  
Phenol, dodecyl-, branched, sulfurized  
phenol, dodecyl-, branched; phenol, 2-dodecyl-, branched; phenol, 3-dodecyl-, branched  
Residual oils (petroleum,) solvent-refined

## SECTION 16: Other information

Indication of changes:

Section	Changed item	Change	Notes
2.1	Adverse physicochemical, human health and environmental effects	Modified	
2.3	Other hazards not contributing to the classification	Added	

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

3	Composition/information on ingredients	Modified	
3.2	Comments	Added	
3.2	Notes	Added	
4.1	First-aid measures after ingestion	Modified	
4.1	First-aid measures after skin contact	Modified	
4.1	First-aid measures after eye contact	Modified	
4.2	Symptoms/effects after ingestion	Modified	
4.3	Other medical advice or treatment	Modified	
5.2	Hazardous decomposition products in case of fire	Added	
5.3	Special protective equipment for firefighters	Modified	
5.3	Firefighting instructions	Modified	
7.1	Precautions for safe handling	Modified	
7.1	Hygiene measures	Modified	
7.1	Handling temperature	Removed	
7.2	Storage temperature	Removed	
8.1	DNEL/DMEL and PNEC values	Added	
8.2	Respiratory protection	Modified	
8.2	Appropriate engineering controls	Modified	
9.1	Explosive limits (vol %)	Added	
9.1	Vapour pressure	Added	
9.1	Boiling point	Added	
9.1	Auto-ignition temperature	Added	
9.1	Freezing point	Added	
9.1	Molecular mass	Removed	
10.4	Conditions to avoid	Modified	
11.1	Additional information	Modified	
11.1	Additional information	Modified	
11.1	Additional information	Modified	
11.1	Additional information	Modified	
14.6	Special transport precautions	Removed	
15.1	Other information, restrictions and prohibition regulations	Modified	
15.1	Storage class (LGK) (D)	Modified	
15.1	REACH Annex XVII	Modified	
15.1	Other information, restriction and prohibition regulations	Added	
16	Other information	Modified	
16	Indication of changes	Added	

### Abbreviations and acronyms:

	Complete text of the H phrases quoted in this Safety Data Sheet. These phrases are reported here for information only, and MAY NOT correspond to the classification of the product.
	N/D = not available
	N/A = not applicable
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC50	Effective concentration for 50 percent of test population (median effective concentration)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration for 50 percent of test population (median lethal concentration)
LD50	Lethal dose for 50 percent of test population (median lethal dose)
LOAEL	Lowest Observed Adverse Effect Level

# Eni Mix 2T

## Safety Data Sheet

According to Regulation (EU) No. 830/2015

NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals, Regulation (EC) No 1907/2006
RID	Regulation concerning the International Carriage of Dangerous Goods by Railways
SDS	Safety Data Sheet
STP	Sewage treatment plant
vPvB	Very Persistent and Very Bioaccumulative

Data sources	: This Safety Data Sheet is based on the real characteristics of the components and their combination, taking into account the information provided by the suppliers.
Training advice	: Provide adequate training to professional operators for the use of PPEs, according to the information contained in this Safety Data Sheet.
Other information	: Do not use the product for any purposes that have not been advised by the manufacturer. In exceptional cases (i.e prolonged storage in tanks contaminated with water, and presence of anaerobic sulfate-reducing microbial colonies), the product may undergo a degradation and generate small amounts of sulfur compounds, including H <sub>2</sub> S. This situation is especially relevant in all those circumstances which require to enter a confined space, with direct exposure to the vapours. If this possibility is suspected, a specific assessment of inhalation risks from the presence of H <sub>2</sub> S in confined spaces must be made, to help determine prevention measures and controls (i.e. PPE) appropriate to local circumstances, and adequate emergency procedures. If there is any suspicion of inhalation of H <sub>2</sub> S (hydrogen sulphide), Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures. Send patient to hospital. Immediately begin artificial respiration if breathing has ceased. Administer oxygen if necessary. This situation is especially relevant for those operations which involve direct exposure to the vapours in the interior of tanks or other confined spaces.

Full text of H- and EUH-statements:

Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 4	Hazardous to the aquatic environment — Chronic Hazard, Category 4
Asp. Tox. 1	Aspiration hazard, Category 1
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Repr. 1B	Reproductive toxicity, Category 1B
Skin Corr. 1C	Skin corrosion/irritation, Category 1C
H304	May be fatal if swallowed and enters airways.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H360F	May damage fertility.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Aquatic Chronic 3	H412	Calculation method
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SDS EU (REACH Annex II)

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

## 9.1. Exposure scenario 1: Manufacture - Manufacture of the substance

<b>Environment contributing scenario(s):</b>	
Manufacture	ERC 1
<b>Worker contributing scenario(s):</b>	
Manufacturing in closed batch process	PROC 3
Manufacturing in batch with occasional exposure opportunity	PROC 4
Loading/Unloading in dedicated facilities	PROC 8b
Use as laboratory reagent	PROC 15

### 9.1.1. Environmental contributing scenario 1: Manufacture

#### 9.1.1.1. Conditions of use

<b>Amount used, frequency and duration of use (or from service life)</b>
• Daily use at site: $\leq 8.5$ tonnes/day
• Annual use at a site: $\leq 600$ tonnes/year
• Percentage of tonnage used at regional scale: = 100 %
<b>Conditions and measures related to sewage treatment plant</b>
• Municipal STP: Yes [Effectiveness Water: 85.81%]
• Discharge rate of STP: $\geq 2E3$ m <sup>3</sup> /d
• Application of the STP sludge on agricultural soil: No
<b>Conditions and measures related to treatment of waste (including article waste)</b>
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
<b>Other conditions affecting environmental exposure</b>
• Receiving surface water flow rate: $\geq 1.8E4$ m <sup>3</sup> /d

#### 9.1.1.2. Releases

The local releases to the environment are reported in the following table.

**Table 1. Local releases to the environment**

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	<b>Initial release factor:</b> 0.001% <b>Final release factor:</b> 0.001% <b>Local release rate:</b> 0.085 kg/day
Air	Release factor	<b>Initial release factor:</b> 0.001% <b>Final release factor:</b> 0.001% <b>Local release rate:</b> 0.085 kg/day
Soil	Release factor	<b>Final release factor:</b> 0%

#### 9.1.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 2. Exposure concentrations and risks for the environment**

Protection target	Exposure concentration	Risk characterisation
Freshwater	Local PEC: 5.248E-4 mg/L	RCR < 0.01
Sediment (freshwater)	Local PEC: 5.25 mg/kg dw	RCR < 0.01
Marine water	Local PEC: 5.248E-5 mg/L	RCR < 0.01
Sediment (marine water)	Local PEC: 0.525 mg/kg dw	RCR < 0.01
Sewage treatment plant	Local PEC: 0.006 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 9.033E-4 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	Local PEC: 4.574E-6 mg/m <sup>3</sup>	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.04 mg/kg bw/day	RCR = 0.158
Man via environment - combined routes		RCR = 0.158

**Table 3. Contribution to oral intake for man via the environment from local contribution**

Type of food	Estimated daily dose	Concentration in food
Drinking water	7.263E-7 mg/kg bw/day	2.542E-5 mg/L
Fish	3.675E-7 mg/kg bw/day	2.237E-4 mg/kg ww
Leaf crops	4.784E-4 mg/kg bw/day	0.028 mg/kg ww
Root crops	0.038 mg/kg bw/day	6.935 mg/kg ww
Meat	6.452E-4 mg/kg bw/day	0.15 mg/kg ww
Milk	3.803E-4 mg/kg bw/day	0.047 mg/kg ww

**Conclusion on risk characterisation**

No release in water of the substance is expected during production processes except for the cleaning activities of facilities: thus we assume a negligible emission in the water compartment.

Waste water of the plant is collected and directly sent with a dedicated close system to a treatment microbiological plant strictly controlled by local legislation

**9.1.2. Worker contributing scenario 1: Manufacturing in closed batch process (PROC 3)****9.1.2.1. Conditions of use**

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: Substance as such	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Closed batch process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374 with	TRA Worker v3

	Method
specific activity training) [Effectiveness Dermal: 95%]	
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3
• Skin surface potentially exposed: One hand face only (240 cm <sup>2</sup> )	TRA Worker v3

### 9.1.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 4. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>2.079 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.59
Inhalation, systemic, acute	<b>2.079 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.031
Dermal, systemic, long-term	<b>0.034 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.033
Combined routes, systemic, long-term		RCR = 0.623
Combined routes, systemic, acute		RCR = 0.031

### Conclusion on risk characterisation

The substance is not classified for dermal irritation or dermal toxicity, nevertheless it is classified as suspected reproductive toxicant and any contact has to be avoided; the use of gloves is therefore always recommended

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

### 9.1.3. Worker contributing scenario 2: Manufacturing in batch with occasional exposure opportunity (PROC 4)

#### 9.1.3.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: Substance as such	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3

	Method
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3
• Skin surface potentially exposed: Two hands face (480 cm <sup>2</sup> )	TRA Worker v3

### 9.1.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 5. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>2.079 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.59
Inhalation, systemic, acute	<b>2.079 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.031
Dermal, systemic, long-term	<b>0.343 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.33
Combined routes, systemic, long-term		RCR = 0.92
Combined routes, systemic, acute		RCR = 0.031

### Conclusion on risk characterisation

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

### 9.1.4. Worker contributing scenario 3: Loading/Unloading in dedicated facilities (PROC 8b)

#### 9.1.4.1. Conditions of use

The substance is stored before the next step; loading is therefore considered in this step

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: Substance as such	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Enhanced general ventilation (5-10 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3

	Method
• Process temperature (for liquid): <= 40 °C	TRA Worker v3
• Skin surface potentially exposed: Two hands (960 cm <sup>2</sup> )	TRA Worker v3

#### 9.1.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 6. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.624 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.177
Inhalation, systemic, acute	<b>0.624 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.686 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.659
Combined routes, systemic, long-term		RCR = 0.836
Combined routes, systemic, acute		RCR < 0.01

#### Conclusion on risk characterisation

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

#### 9.1.5. Worker contributing scenario 4: Use as laboratory reagent (PROC 15)

##### 9.1.5.1. Conditions of use

Sampling

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: Substance as such	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: No	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: No [Effectiveness Dermal: 0%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): <= 40 °C	TRA Worker v3
• Skin surface potentially exposed: One hand face only (240 cm <sup>2</sup> )	TRA Worker v3



### 9.1.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 7. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>2.079 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.59
Inhalation, systemic, acute	<b>2.079 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.031
Dermal, systemic, long-term	<b>0.34 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.327
Combined routes, systemic, long-term		RCR = 0.917
Combined routes, systemic, acute		RCR = 0.031

### Conclusion on risk characterisation

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

## 9.2. Exposure scenario 2: Formulation - Formulation of additive package

<b>Environment contributing scenario(s):</b>	
Formulation of additive composition	ERC 2
<b>Worker contributing scenario(s):</b>	
Mixing/blending	PROC 5
Loading/unloading in dedicated facilities	PROC 8b

### 9.2.1. Environmental contributing scenario 1: Formulation of additive composition

#### 9.2.1.1. Conditions of use

<b>Amount used, frequency and duration of use (or from service life)</b>
• Daily use at site: <= 15 tonnes/day
• Annual use at a site: <= 600 tonnes/year
• Percentage of tonnage used at regional scale: = 100 %
<b>Conditions and measures related to sewage treatment plant</b>
• Municipal STP: Yes [Effectiveness Water: 85.81%]
• Discharge rate of STP: >= 2E3 m3/d
• Application of the STP sludge on agricultural soil: No
<b>Conditions and measures related to treatment of waste (including article waste)</b>
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
<b>Other conditions affecting environmental exposure</b>
• Receiving surface water flow rate: >= 1.8E4 m3/d

#### 9.2.1.2. Releases

The local releases to the environment are reported in the following table.

**Table 8. Local releases to the environment**

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	<b>Initial release factor:</b> 1E-4% <b>Final release factor:</b> 1E-4% <b>Local release rate:</b> 0.015 kg/day
Air	Release factor	<b>Initial release factor:</b> 1E-4% <b>Final release factor:</b> 1E-4% <b>Local release rate:</b> 0.015 kg/day
Soil	Release factor	<b>Final release factor:</b> 0%

#### 9.2.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 9. Exposure concentrations and risks for the environment**

Protection target	Exposure concentration	Risk characterisation
Freshwater	<b>Local PEC:</b> 9.281E-5 mg/L	RCR < 0.01
Sediment (freshwater)	<b>Local PEC:</b> 0.928 mg/kg dw	RCR < 0.01

Protection target	Exposure concentration	Risk characterisation
Marine water	Local PEC: 9.284E-6 mg/L	RCR < 0.01
Sediment (marine water)	Local PEC: 0.093 mg/kg dw	RCR < 0.01
Sewage treatment plant	Local PEC: 0.001 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 3.049E-4 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	Local PEC: 4.608E-7 mg/m <sup>3</sup>	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.013 mg/kg bw/day	RCR = 0.051
Man via environment - combined routes		RCR = 0.051

**Table 10. Contribution to oral intake for man via the environment from local contribution**

Type of food	Estimated daily dose	Concentration in food
Drinking water	7.414E-8 mg/kg bw/day	2.595E-6 mg/L
Fish	3.751E-8 mg/kg bw/day	2.283E-5 mg/kg ww
Leaf crops	4.82E-5 mg/kg bw/day	0.003 mg/kg ww
Root crops	0.013 mg/kg bw/day	2.317 mg/kg ww
Meat	6.503E-5 mg/kg bw/day	0.015 mg/kg ww
Milk	3.833E-5 mg/kg bw/day	0.005 mg/kg ww

**Conclusion on risk characterisation**

No release in water of the substance is expected during formulation except for the cleaning activities of facilities: thus we assume a negligible emission in the water compartment  
Waste water of the plant is collected and sent to a dedicated treatment controlled by local legislation

**9.2.2. Worker contributing scenario 1: Mixing/blending (PROC 5)****9.2.2.1. Conditions of use**

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: 1-5%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: No	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3

	Method
• Skin surface potentially exposed: Two hands face (480 cm <sup>2</sup> )	TRA Worker v3

### 9.2.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 11. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.416 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.118
Inhalation, systemic, acute	<b>0.416 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.137 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.132
Combined routes, systemic, long-term		RCR = 0.25
Combined routes, systemic, acute		RCR < 0.01

### Conclusion on risk characterisation

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

### 9.2.3. Worker contributing scenario 2: Loading/unloading in dedicated facilities (PROC 8b)

#### 9.2.3.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: 1-5%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374 with specific activity training) [Effectiveness Dermal: 95%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3
• Skin surface potentially exposed: Two hands (960 cm <sup>2</sup> )	TRA Worker v3

### 9.2.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 12. Exposure concentrations and risks for workers**

<b>Route of exposure and type of effects</b>	<b>Exposure concentration</b>	<b>Risk characterisation</b>
Inhalation, systemic, long-term	<b>0.416 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.118
Inhalation, systemic, acute	<b>0.416 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.137 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.132
Combined routes, systemic, long-term		RCR = 0.25
Combined routes, systemic, acute		RCR < 0.01

**Conclusion on risk characterisation**

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

### 9.3. Exposure scenario 3: Formulation - Formulation of lubricant oil

<b>Environment contributing scenario(s):</b>	
Formulation of lubricant oil	ERC 2
<b>Worker contributing scenario(s):</b>	
Mixing and blending	PROC 5
Loading/unloading in dedicated facilities	PROC 8b

#### 9.3.1. Environmental contributing scenario 1: Formulation of lubricant oil

##### 9.3.1.1. Conditions of use

<b>Amount used, frequency and duration of use (or from service life)</b>
• Daily use at site: <= 15 tonnes/day
• Annual use at a site: <= 600 tonnes/year
• Percentage of tonnage used at regional scale: = 100 %
<b>Conditions and measures related to sewage treatment plant</b>
• Municipal STP: Yes [Effectiveness Water: 85.81%]
• Discharge rate of STP: >= 2E3 m3/d
• Application of the STP sludge on agricultural soil: No
<b>Conditions and measures related to treatment of waste (including article waste)</b>
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
<b>Other conditions affecting environmental exposure</b>
• Receiving surface water flow rate: >= 1.8E4 m3/d

##### 9.3.1.2. Releases

The local releases to the environment are reported in the following table.

**Table 13. Local releases to the environment**

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	<b>Initial release factor:</b> 1E-4% <b>Final release factor:</b> 1E-4% <b>Local release rate:</b> 0.015 kg/day
Air	Release factor	<b>Initial release factor:</b> 1E-4% <b>Final release factor:</b> 1E-4% <b>Local release rate:</b> 0.015 kg/day
Soil	Release factor	<b>Final release factor:</b> 0%

##### 9.3.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 14. Exposure concentrations and risks for the environment**

Protection target	Exposure concentration	Risk characterisation
Freshwater	<b>Local PEC:</b> 9.281E-5 mg/L	RCR < 0.01
Sediment (freshwater)	<b>Local PEC:</b> 0.928 mg/kg dw	RCR < 0.01

Protection target	Exposure concentration	Risk characterisation
Marine water	Local PEC: 9.284E-6 mg/L	RCR < 0.01
Sediment (marine water)	Local PEC: 0.093 mg/kg dw	RCR < 0.01
Sewage treatment plant	Local PEC: 0.001 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 3.049E-4 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	Local PEC: 4.608E-7 mg/m <sup>3</sup>	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.013 mg/kg bw/day	RCR = 0.051
Man via environment - combined routes		RCR = 0.051

**Table 15. Contribution to oral intake for man via the environment from local contribution**

Type of food	Estimated daily dose	Concentration in food
Drinking water	7.414E-8 mg/kg bw/day	2.595E-6 mg/L
Fish	3.751E-8 mg/kg bw/day	2.283E-5 mg/kg ww
Leaf crops	4.82E-5 mg/kg bw/day	0.003 mg/kg ww
Root crops	0.013 mg/kg bw/day	2.317 mg/kg ww
Meat	6.503E-5 mg/kg bw/day	0.015 mg/kg ww
Milk	3.833E-5 mg/kg bw/day	0.005 mg/kg ww

### Conclusion on risk characterisation

No release in water of the substance is expected during formulation except for the cleaning activities of facilities: thus we assume a negligible emission in the water compartment  
Waste water of the plant is collected and sent to a dedicated treatment controlled by local legislation

## 9.3.2. Worker contributing scenario 1: Mixing and blending (PROC 5)

### 9.3.2.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: <1%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: No	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374) [Effectiveness Dermal: 80%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3

	Method
• Skin surface potentially exposed: Two hands face (480 cm <sup>2</sup> )	TRA Worker v3

### 9.3.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 16. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.059
Inhalation, systemic, acute	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.274 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.264
Combined routes, systemic, long-term		RCR = 0.323
Combined routes, systemic, acute		RCR < 0.01

### Conclusion on risk characterisation

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

### 9.3.3. Worker contributing scenario 2: Loading/unloading in dedicated facilities (PROC 8b)

#### 9.3.3.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: <1%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374) [Effectiveness Dermal: 80%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3
• Skin surface potentially exposed: Two hands (960 cm <sup>2</sup> )	TRA Worker v3

### 9.3.3.2. Exposure and risks for workers



The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 17. Exposure concentrations and risks for workers**

<b>Route of exposure and type of effects</b>	<b>Exposure concentration</b>	<b>Risk characterisation</b>
Inhalation, systemic, long-term	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.059
Inhalation, systemic, acute	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.274 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.264
Combined routes, systemic, long-term		RCR = 0.323
Combined routes, systemic, acute		RCR < 0.01

#### **Conclusion on risk characterisation**

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

## 9.4. Exposure scenario 4: Use at industrial site - Industrial use of lubricant oil

### Sector of use:

SU 17, General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.

<b>Environment contributing scenario(s):</b>	
Industrial use of lubricant oil	ERC 7
<b>Worker contributing scenario(s):</b>	
Industrial use of lubricant oil	PROC 4
Loading/unloading in dedicated facilities	PROC 8b

### 9.4.1. Environmental contributing scenario 1: Industrial use of lubricant oil

#### 9.4.1.1. Conditions of use

<b>Amount used, frequency and duration of use (or from service life)</b>
• Daily use at site: <= 0.05 tonnes/day
• Annual use at a site: <= 5 tonnes/year
• Percentage of tonnage used at regional scale: = 10 %
<b>Conditions and measures related to sewage treatment plant</b>
• Municipal STP: Yes [Effectiveness Water: 85.81%]
• Discharge rate of STP: >= 2E3 m3/d
• Application of the STP sludge on agricultural soil: No
<b>Conditions and measures related to treatment of waste (including article waste)</b>
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
<b>Other conditions affecting environmental exposure</b>
• Receiving surface water flow rate: >= 1.8E4 m3/d

#### 9.4.1.2. Releases

The local releases to the environment are reported in the following table.

**Table 18. Local releases to the environment**

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	<b>Initial release factor:</b> 0.001% <b>Final release factor:</b> 0.001% <b>Local release rate:</b> 5E-4 kg/day
Air	Release factor	<b>Initial release factor:</b> 0.001% <b>Final release factor:</b> 0.001% <b>Local release rate:</b> 5E-4 kg/day
Soil	Release factor	<b>Final release factor:</b> 0%

**9.4.1.3. Exposure and risks for the environment and man via the environment**

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 19. Exposure concentrations and risks for the environment**

Protection target	Exposure concentration	Risk characterisation
Freshwater	Local PEC: 3.32E-6 mg/L	RCR < 0.01
Sediment (freshwater)	Local PEC: 0.033 mg/kg dw	RCR < 0.01
Marine water	Local PEC: 3.351E-7 mg/L	RCR < 0.01
Sediment (marine water)	Local PEC: 0.003 mg/kg dw	RCR < 0.01
Sewage treatment plant	Local PEC: 3.549E-5 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 2.439E-4 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	Local PEC: 4.187E-8 mg/m <sup>3</sup>	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.01 mg/kg bw/day	RCR = 0.041
Man via environment - combined routes		RCR = 0.041

**Table 20. Contribution to oral intake for man via the environment from local contribution**

Type of food	Estimated daily dose	Concentration in food
Drinking water	7.714E-9 mg/kg bw/day	2.7E-7 mg/L
Fish	3.903E-9 mg/kg bw/day	2.376E-6 mg/kg ww
Leaf crops	4.381E-6 mg/kg bw/day	2.555E-4 mg/kg ww
Root crops	0.01 mg/kg bw/day	1.846 mg/kg ww
Meat	5.942E-6 mg/kg bw/day	0.001 mg/kg ww
Milk	3.502E-6 mg/kg bw/day	4.37E-4 mg/kg ww

**Conclusion on risk characterisation**

Any RMMs to avoid the dispersion of the substance into the environment have to be applied. Exhausted oils are collected and sent to dedicated facilities for treatment.

**9.4.2. Worker contributing scenario 1: Industrial use of lubricant oil (PROC 4)****9.4.2.1. Conditions of use**

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: <1%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: No [Effectiveness Dermal: 0%]	TRA Worker v3

	Method
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): <= 40 °C	TRA Worker v3
• Skin surface potentially exposed: Two hands face (480 cm <sup>2</sup> )	TRA Worker v3

#### 9.4.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 21. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.059
Inhalation, systemic, acute	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.686 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.66
Combined routes, systemic, long-term		RCR = 0.719
Combined routes, systemic, acute		RCR < 0.01

#### **Conclusion on risk characterisation**

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

#### 9.4.3. Worker contributing scenario 2: Loading/unloading in dedicated facilities (PROC 8b)

##### 9.4.3.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: <1%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Advanced	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: Yes (chemically resistant gloves conforming to EN374) [Effectiveness Dermal: 80%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): <= 40 °C	TRA Worker v3

	Method
• Skin surface potentially exposed: Two hands (960 cm <sup>2</sup> )	TRA Worker v3

#### 9.4.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 22. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.059
Inhalation, systemic, acute	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.274 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.264
Combined routes, systemic, long-term		RCR = 0.323
Combined routes, systemic, acute		RCR < 0.01

#### **Conclusion on risk characterisation**

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

## 9.5. Exposure scenario 5: Use by professional worker - Professional use of lubricant oil

### Sector of use:

SU 17, General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.

<b>Environment contributing scenario(s):</b>	
Professional use of lubricant oil	ERC 9b
<b>Worker contributing scenario(s):</b>	
Professional use of lubricant oil	PROC 20
Loading/unloading inot small containers	PROC 9

### 9.5.1. Environmental contributing scenario 1: Professional use of lubricant oil

#### 9.5.1.1. Conditions of use

<b>Amount used, frequency and duration of use (or from service life)</b>
• Daily wide dispersive use: $\leq 1.1E-4$ tonnes/day
• Percentage of tonnage used at regional scale: = 10 %
<b>Conditions and measures related to sewage treatment plant</b>
• Municipal STP: Yes [Effectiveness Water: 85.81%]
• Discharge rate of STP: $\geq 2E3$ m <sup>3</sup> /d
• Application of the STP sludge on agricultural soil: Yes
<b>Conditions and measures related to treatment of waste (including article waste)</b>
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
<b>Other conditions affecting environmental exposure</b>
• Receiving surface water flow rate: $\geq 1.8E4$ m <sup>3</sup> /d

#### 9.5.1.2. Releases

The local releases to the environment are reported in the following table.

**Table 23. Local releases to the environment**

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	<b>Initial release factor:</b> 0.1% <b>Final release factor:</b> 0.1% <b>Local release rate:</b> 1.1E-4 kg/day
Air	Release factor	<b>Initial release factor:</b> 0.1% <b>Final release factor:</b> 0.1%
Soil	Release factor	<b>Final release factor:</b> 0%

#### 9.5.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 24. Exposure concentrations and risks for the environment**

Protection target	Exposure concentration	Risk characterisation
Freshwater	Local PEC: 9.135E-7 mg/L	RCR < 0.01
Sediment (freshwater)	Local PEC: 0.009 mg/kg dw	RCR < 0.01
Marine water	Local PEC: 9.443E-8 mg/L	RCR < 0.01
Sediment (marine water)	Local PEC: 9.446E-4 mg/kg dw	RCR < 0.01
Sewage treatment plant	Local PEC: 7.807E-6 mg/L	RCR < 0.01
Agricultural soil	Local PEC: 0.002 mg/kg dw	RCR < 0.01
Man via Environment - Inhalation	Local PEC: 3.811E-9 mg/m <sup>3</sup>	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.091 mg/kg bw/day	RCR = 0.365
Man via environment - combined routes		RCR = 0.365

**Table 25. Contribution to oral intake for man via the environment from local contribution**

Type of food	Estimated daily dose	Concentration in food
Drinking water	3.144E-8 mg/kg bw/day	1.101E-6 mg/L
Fish	3.302E-9 mg/kg bw/day	2.01E-6 mg/kg ww
Leaf crops	4.131E-7 mg/kg bw/day	2.41E-5 mg/kg ww
Root crops	0.091 mg/kg bw/day	16.65 mg/kg ww
Meat	7.087E-7 mg/kg bw/day	1.648E-4 mg/kg ww
Milk	4.177E-7 mg/kg bw/day	5.212E-5 mg/kg ww

### Conclusion on risk characterisation

Any RMMs to avoid the dispersion of the substance into the environment have to be applied. Exhausted oils are collected and sent to dedicated facilities for treatment.

## 9.5.2. Worker contributing scenario 1: Professional use of lubricant oil (PROC 20)

### 9.5.2.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: <1%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: No	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Basic	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: No [Effectiveness Dermal: 0%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3

	Method
• Skin surface potentially exposed: Two hands face (480 cm <sup>2</sup> )	TRA Worker v3

### 9.5.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 26. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.059
Inhalation, systemic, acute	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.171 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.164
Combined routes, systemic, long-term		RCR = 0.223
Combined routes, systemic, acute		RCR < 0.01

### Conclusion on risk characterisation

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

### 9.5.3. Worker contributing scenario 2: Loading/unloading inot small containers (PROC 9)

#### 9.5.3.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Concentration of substance in mixture: <1%	TRA Worker v3
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
• Duration of activity: < 8 hours	TRA Worker v3
<b>Technical and organisational conditions and measures</b>	
• General ventilation: Basic general ventilation (1-3 air changes per hour)	TRA Worker v3
• Containment: Semi-closed process with occasional controlled exposure	TRA Worker v3
• Local exhaust ventilation: no [Effectiveness Inhal: 0%]	TRA Worker v3
• Occupational Health and Safety Management System: Basic	TRA Worker v3
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
• Dermal Protection: No [Effectiveness Dermal: 0%]	TRA Worker v3
• Respiratory Protection: No [Effectiveness Inhal: 0%]	TRA Worker v3
<b>Other conditions affecting workers exposure</b>	
• Place of use: Indoor	TRA Worker v3
• Process temperature (for liquid): ≤ 40 °C	TRA Worker v3
• Skin surface potentially exposed: Two hands face (480 cm <sup>2</sup> )	TRA Worker v3



### 9.5.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 27. Exposure concentrations and risks for workers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR = 0.059
Inhalation, systemic, acute	<b>0.208 mg/m<sup>3</sup></b> (TRA Worker v3)	RCR < 0.01
Dermal, systemic, long-term	<b>0.686 mg/kg bw/day</b> (TRA Worker v3)	RCR = 0.66
Combined routes, systemic, long-term		RCR = 0.719
Combined routes, systemic, acute		RCR < 0.01

#### **Conclusion on risk characterisation**

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

## 9.6. Exposure scenario 6: Consumer Use - Consumer Use of lubricant oil

<b>Environment contributing scenario(s):</b>	
Consumer Use of lubricant oil	ERC 9b
<b>Consumer contributing scenario(s):</b>	
Consumer use of lubricant oils	PC 24

### 9.6.1. Environmental contributing scenario 1: Consumer Use of lubricant oil

#### 9.6.1.1. Conditions of use

<b>Amount used, frequency and duration of use (or from service life)</b>
• Daily wide dispersive use: $\leq 5.5E-5$ tonnes/day
• Percentage of tonnage used at regional scale: = 10 %
<b>Conditions and measures related to treatment of waste (including article waste)</b>
• Particular considerations on the waste treatment operations: No (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
<b>Other conditions affecting environmental exposure</b>
• Municipal STP: Yes [Effectiveness Water: 85.81%]
• Discharge rate of STP: $\geq 2E3$ m <sup>3</sup> /d
• Application of the STP sludge on agricultural soil: Yes
• Receiving surface water flow rate: $\geq 1.8E4$ m <sup>3</sup> /d

#### 9.6.1.2. Releases

The local releases to the environment are reported in the following table.

**Table 28. Local releases to the environment**

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	<b>Initial release factor:</b> 0.1% <b>Final release factor:</b> 0.1% <b>Local release rate:</b> 5.5E-5 kg/day
Air	Release factor	<b>Initial release factor:</b> 0.1% <b>Final release factor:</b> 0.1%
Soil	Release factor	<b>Final release factor:</b> 0%

#### 9.6.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 29. Exposure concentrations and risks for the environment**

Protection target	Exposure concentration	Risk characterisation
Freshwater	<b>Local PEC:</b> 5.74E-7 mg/L	RCR < 0.01
Sediment (freshwater)	<b>Local PEC:</b> 0.006 mg/kg dw	RCR < 0.01
Marine water	<b>Local PEC:</b> 6.049E-8 mg/L	RCR < 0.01
Sediment (marine water)	<b>Local PEC:</b> 6.051E-4 mg/kg dw	RCR < 0.01
Sewage treatment plant	<b>Local PEC:</b> 3.903E-6 mg/L	RCR < 0.01
Agricultural soil	<b>Local PEC:</b> 0.001 mg/kg dw	RCR < 0.01

Protection target	Exposure concentration	Risk characterisation
Man via Environment - Inhalation	Local PEC: 3.798E-9 mg/m <sup>3</sup>	RCR < 0.01
Man via Environment - Oral	Exposure via food consumption: 0.051 mg/kg bw/day	RCR = 0.202
Man via environment - combined routes		RCR = 0.202

**Table 30. Contribution to oral intake for man via the environment from local contribution**

Type of food	Estimated daily dose	Concentration in food
Drinking water	1.743E-8 mg/kg bw/day	6.099E-7 mg/L
Fish	2.075E-9 mg/kg bw/day	1.263E-6 mg/kg ww
Leaf crops	4.053E-7 mg/kg bw/day	2.364E-5 mg/kg ww
Root crops	0.051 mg/kg bw/day	9.229 mg/kg ww
Meat	6.399E-7 mg/kg bw/day	1.488E-4 mg/kg ww
Milk	3.772E-7 mg/kg bw/day	4.706E-5 mg/kg ww

### Conclusion on risk characterisation

Any RMMs to avoid the dispersion of the substance into the environment have to be applied. Exhausted oils are collected and sent to dedicated facilities for treatment.

## 9.6.2. Consumer contributing scenario 1: Consumer use of lubricant oils (PC 24)

### 9.6.2.1. Conditions of use

	Method
<b>Product (article) characteristics</b>	
• Product/Article subcategory: Liquids	TRA Consumer v3
• Concentration of substance in mixture: = 0.005 g/g	TRA Consumer v3
• Oral contact foreseen: No	TRA Consumer v3
<b>Amount used, frequency and duration of use/exposure</b>	
• Amount of product used per application: = 1E3 g/event	TRA Consumer v3
• Exposure time: = 4 hr	TRA Consumer v3
• Frequency of use: = 1 events/day	TRA Consumer v3
<b>Other conditions affecting consumers exposure</b>	
• Body parts potentially exposed: Hands	TRA Consumer v3
• Dermal transfer factor: = 0.1	TRA Consumer v3

### 9.6.2.2. Exposure and risks for consumers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

**Table 31. Exposure concentrations and risks for consumers**

Route of exposure and type of effects	Exposure concentration	Risk characterisation
Inhalation, systemic, long-term	0.074 mg/m <sup>3</sup> (TRA Consumer v3)	RCR = 0.085
Inhalation, systemic, acute		
Dermal, systemic, long-term	0.071 mg/kg bw/day (TRA Consumer v3)	RCR = 0.137

EC number:  
306-115-5

Phenol, dodecyl-, branched, sulfurized

CAS number:  
96152-43-1

<b>Route of exposure and type of effects</b>	<b>Exposure concentration</b>	<b>Risk characterisation</b>
Oral, systemic, long-term	<b>0 mg/kg bw/day</b> (TRA Consumer v3)	RCR < 0.01
Combined routes, systemic, long-term		RCR = 0.222

#### **Conclusion on risk characterisation**

The substance doesn't present any risk for acute and local exposure, nevertheless it is classified as suspected reproductive toxicant; it is therefore recommended to minimize the exposure with the use of gloves and a well ventilated place during handling

## 10. RISK CHARACTERISATION RELATED TO COMBINED EXPOSURE

### 10.1. Human health

Not relevant

#### 10.1.1. Workers

#### 10.1.2. Consumer

### 10.2. Environment (combined for all emission sources)

#### 10.2.1. All uses (regional scale)

##### 10.2.1.1. Total releases

The total releases to the environment from all the exposure scenarios covered are presented in the table below. This is the sum of the releases to the environments from all exposure scenarios addressed.

**Table 32. Total releases to the environment per year from all life cycle stages:**

Release route	Total releases per year
Water	310.2 kg/year
Air	310.2 kg/year
Soil	0 kg/year

##### 10.2.1.2. Regional exposure

###### Environment

The regional predicted environmental concentration (PEC regional) and the related risk characterisation ratios when a PNEC is available are presented in the table below.

The PEC regional have been estimated with EUSES.

**Table 33. Predicted regional exposure concentrations (Regional PEC)**

Protection target	Regional PEC	RCR
Freshwater	2.346E-7 mg/L	< 0.01
Sediment (freshwater)	0.005 mg/kg dw	< 0.01
Marine water	2.655E-8 mg/L	< 0.01
Sediment (marine water)	5.211E-4 mg/kg dw	< 0.01
Air	3.786E-9 mg/m <sup>3</sup>	
Agricultural soil	2.384E-4 mg/kg dw	< 0.01

###### Man via environment

The exposure to man via the environment from regional exposure and the related risk characterisation ratios are presented in the table below. The exposure concentration via inhalation is equal to the PEC air.

**Table 34. Regional exposure to man via the environment**

Route	Regional exposure	RCR
Inhalation	3.786E-9 mg/m <sup>3</sup>	< 0.01
Oral	0.055 mg/kg bw/day	0.218
Combined routes		0.218

### 10.2.2. Local exposure due to all wide dispersive uses

#### Environment

The predicted local environmental concentrations (PEC local) based on the releases from all widespread uses are reported in the table below together with the risk characterisation ratio when a PNEC is available. Those exposure estimates have been obtained with EUSES.

**Table 35. Predicted environmental concentration and risk characterisation ratio for the environment due to all wide dispersive uses**

Protection target	PEC local due to all wide dispersive uses	RCR
Freshwater	1.253E-6 mg/L	< 0.01
Sediment (freshwater)	0.013 mg/kg dw	< 0.01
Marine water	1.284E-7 mg/L	< 0.01
Sediment (marine water)	0.001 mg/kg dw	< 0.01
Sewage treatment plant	1.171E-5 mg/L	< 0.01
Agricultural soil	0.003 mg/kg dw	< 0.01

#### Man via environment

The exposure to man via the environment based on the releases from all widespread uses is reported in the table below together with the risk characterisation ratio when a DNEL is available. Those exposure estimates have been obtained with EUSES.

**Table 36. Exposure and risk characterisation ratio for man via the environment due to all wide dispersive uses**

Protection target	Exposure concentration due to all wide dispersive uses	RCR
Inhalation	3.823E-9 mg/m <sup>3</sup>	< 0.01
Oral	0.132 mg/kg bw/day	0.528
Combined routes		0.528

### 10.2.3. Local exposure due to combined uses at a site

Not relevant

## EXPOSURE ASSESSMENT

Overview of exposure scenario (ES)

Overview on exposure scenarios and coverage of substance life cycle

IU number	Identified Use (IU) name	Sector of end use (SU)	Process category (PROC)	Environmental release category (ERC)
1	Manufacture	3, 8	1, 8b, 15	1
2	Chemical industry; chemical used in synthesis; use of monomer for synthesis of polymer	3, 8	1, 2, 3, 4, 8b, 15	6c

The following basic substance information has been used for the exposure assessments:

Input	Value
CAS No.	121158-58-5
Molecular weight (amu)	262.43 g/mole for the C12-alkyl derivative
Melting Point (°C)	-9 °C (± 3 °C)
Boiling Point (°C)	189-270 °C
Vapour pressure (Pa)	0.012 Pa at 20°C; 0.00012 hPa (total substance – C12 constituent will have lower vapour pressure)
ECETOC TRA Fugacity	low
Log Octanol / water partition coefficient	log Kow is 7.14
Water solubility (mg/L)	1.54 mg/l at 20.0 °C (total substance - C12 constituent will have lower solubility)
Rate constant for hydroxyl radicals in air (cm <sup>3</sup> /molec/sec)	98.1357 E-12
Biodegradability	Not readily biodegradable; not inherently biodegradable

## Exposure Scenario 1: Industrial Manufacture

### 1.1. Exposure Scenario 1 Industrial Manufacture

Table 1. Exposure Scenario 1

<b>Exposure Scenario (ES) Industrial Manufacture</b>	
<b>Substance</b>	
Phenol, dodecyl-, branched EC# 310-154-3 ; CAS# 121158-58-5	
<b>Use Descriptors</b>	
Sector of use	SU 3,8
Process Categories	PROC 1, PROC 8b, PROC 15
Product Category	n/a
Article Category	n/a
Environmental Release Categories	ERC 1
Specific Environmental Release Category	n/a
<b>Processes, tasks, activities covered</b>	
<ul style="list-style-type: none"> <li>• General exposures (closed systems) [CS15].</li> <li>• Process sampling [CS2].</li> <li>• Bulk transfers [CS14]. Transfer of chemicals to vessels or containers at dedicated facility by top filling of bulk containers (rail cars, etc.)</li> <li>• Drum and small package filling [CS6].</li> <li>• Equipment maintenance [CS5].</li> <li>• Laboratory activities [CS36].</li> </ul>	
<b>Operational Conditions and Risk Management Measures</b>	
<b>Control of Worker Exposure</b>	
<b>Product Characteristics</b>	
Physical form of product	liquid
Vapor pressure	Liquid, vapour pressure < 0.1 Pa [OC14].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	10,000 MT/a
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Other Operational Conditions affecting exposure	Assumes use at not > 20°C above ambient [G15]; (unless stated differently) [G13]. Assumes a good basic standard of occupational hygiene is implemented [G1]. Assume a good standard of general ventilation (5-15 air exchanges/hour).



Phenol, dodecyl-, branched

Risk Management Measures			
Exposure Scenario #	Process Cat.	Contributing Scenarios	RMM
ES1-1	PROC 1	General exposures (closed systems) [CS15].	Handle substance within a closed system [E47]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4]. {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear up spills immediately and dispose of waste safely [EI9]}. {Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4]}.
ES1-2	PROC 1	Process sampling [CS2].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation [E66]. Avoid carrying out operation for more than 15 minutes [OC10]
ES1-3	PROC 8b	Bulk transfers [CS14].	Use in semi-automated and predominantly enclosed filling lines [E41]. Ensure material transfers are under containment or extract ventilation [E66]. Avoid carrying out operation for more than 15 minutes [OC10] Wear a respirator conforming to EN140 with Type A/P2 filter or better {PPE29} {Wear suitable gloves (type EN374), coverall and eye protection. [PPE23]}.
ES1-4	PROC 8b	Drum and small package filling [CS6].	Ensure material transfers are under containment or extract ventilation [E66]. Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A/P2 filter or better {PPE29} {Wear suitable gloves (type EN374), coverall and eye protection. [PPE23]}.
ES1-5	PROC 8b	Equipment maintenance [CS5].	Handle substance within a closed system [E47]. Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out operation for more than 4 hours [OC12] Wear a respirator conforming to EN140 with Type A filter or better. [PPE22] Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4]. {Drain down and flush system prior to equipment break-in or maintenance [E55]}. {Clear up spills immediately and dispose of waste safely [EI9]}. {Wear suitable gloves (type EN374), coverall and eye protection. [PPE23]}.

Phenol, dodecyl-, branched

Risk Management Measures			
Exposure Scenario #	Process Cat.	Contributing Scenarios	RMM
ES1-6	PROC 15	Laboratory activities [CS36].	Handle substance within a predominantly closed system provided with extract ventilation [E49]. Provide enhanced mechanical ventilation by mechanical means [E48]. Avoid carrying out operation for more than 1 hour [OC11] Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training [PPE16].

Control of environmental exposure	
Fraction of EU tonnage used in region	1
Regional use tonnage (tonnes/year)	10000
Fraction of regional tonnage used locally	1
Annual site tonnage (tonnes/year)	10000
Maximum daily site tonnage --M <sub>ES</sub> (kg/day)	100,000 kg/d
Fraction of substance in product -- C <sub>ES</sub>	1
Frequency and duration of use	
Emission days -- T <sub>emission</sub> (days/year)	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10 (default)
Local marine water dilution factor	n/a

<b>Other given operational conditions affecting environmental exposure</b>	Use in closed system. No discharge to waste water or STP. On-site implementation of monitoring program for the presence of phenol, dodecyl-, branched in effluent for permit compliance
Release fraction to air from STP	0.05 % (generic calculation using EUSES v2.1.1)
Release fraction to water from STP	8.9% (generic calculation using EUSES v2.1.1)
Release fraction to sludge from process (regional only)	92.1 % (generic calculation using EUSES v2.1.1)
Fraction of emissions to the different environmental compartments	Fraction of emission directed to air – 0.187% Fraction of emission directed to water – 13.9% Fraction of emission directed to soil – 51.9% Fraction of emission directed to sediment – 34% (Fugacity Based Environmental Equilibrium Partitioning Model Level III v 2.70)

Phenol, dodecyl-, branched

Risk Management Measures	-
Examples of technical conditions and measures at process level (source) to prevent release	Handle substance within a closed system [E47]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	<p>When calculating the maximum allowable emissions to the environment the following values are identified for each compartment:</p> <p>Waste Water Emissions Waste water emissions from a plant entering a WWTP or STP must not exceed 1.8 ug/L which equates to 3.5 g/d assuming an external WWTP or STP with a default discharge rate of 2000 m3/d and standard dilution rate.</p> <p>If not discharging to a WWTP or STP, 0.16 ug/L) which equates to 0.32g/d.</p> <p>Soil Emissions Direct emissions to soil during manufacture are considered to be unlikely. The sludge from a WWTP or STP cannot be sprayed onto agricultural land if the waste water influent concentration is &gt;0.4 ug/L.</p>
Treat air emissions to provide a typical removal efficiency of (%)	Air emissions do not require to be treated, as the emissions to air calculated using EUSES v2.1.1, indicate that there is no specific cause for concern to the atmosphere. No measures beyond the applicable local permit regulations are therefore identified as being required to protect the environment.
Treat wastewater (prior to discharge to receiving water) to provide a concentration limit as shown	<p>Emissions in either waste water entering a river with a default flow rate of 1.8E+07 L/d (equivalent to dilution rate 10) or the sea (dilution rate 100) should not exceed the PNEC after dilution.</p> <p>Algorithm fresh water emissions:-  <math display="block">\text{Clocalfresh water} = \text{Clocaleff} / (1 + K_{psusp} * \text{SUSP}_{\text{water}} * 10^{-6}) * \text{DILUTION (TGD Eq. 45)}</math> <math display="block">\text{Clocalwater} = \chi / (1 + 76500 * 15 * 10^{-6}) * 10</math>                     Where <math>\chi = \text{Clocaleff}</math>                      Clocaleffluent &lt; 1.6 ug/l)                      As an additional factor for substances with a log Pow of &gt;5 is included in the equilibrium partitioning method to derive a PNEC sediment, Clocaleffluent must not exceed 0.16 ug/l.</p> <p>Algorithm marine water emissions:-</p>

Phenol, dodecyl-, branched

	$\text{Clocalseawater} = \text{Clocaleff} / (1 + K_{\text{psusp}} * \text{SUSP}_{\text{water}} * 10^{-6}) *$ <p>DILUTION (TGD Equ. 45)</p> $\text{Clocalwater} = \chi / (1 + 76500 * 15 * 10^{-6}) * 100$
Typical onsite wastewater treatment technology provides removal efficiency of (%)	0% biodegradation (EUSES v2.1.1); Dodecylphenol is not readily and not inherently biodegradable.
Organizational measures to prevent/limit release from site	Prevent releases to the environment. Use substance under contained conditions in non-aqueous processes. Monitor concentration in wastewater effluent. Prevent discharge of undissolved substance to, or recover from, wastewater [OMS1]. Do not apply industrial WWTP sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].
Conditions and measures related to WWTP or STP	<p>Waste water emissions from a plant entering a WWTP or STP must not exceed 0.16 ug/L which equates to 0.32 g/d assuming an external WWTP or STP with a default discharge rate of 2000 m<sup>3</sup>/d and standard dilution rate.</p> <p>In order to make the terrestrial assessment safe, sludge from a WWTP or STP must not be spread on agricultural land if the level of TPP in the effluent entering the WWTP or STP is &gt; 0.5 mg/L.</p>
Estimated substance removal from wastewater via WWTP or STP (%)	92.1% - (EUSES v2.1.1) – mainly due to sorption to sludge, no significant biodegradation
Total efficiency of removal from wastewater after onsite and offsite (WWTP or STP) RMMs (%)	>90%
Assumed WWTP or STP flow (m <sup>3</sup> /d)	<p>The exposure assessment based on maximum imported tonnage of 10,000 t/a assumes no WWTP or STP, as a worst case.</p> <p>For the calculation of maximum permissible emissions it is assumed that a WWTP or STP is used with a capacity of at least 2000 m<sup>3</sup>/d.</p>
Conditions and measures related to external treatment of waste for disposal	1) do not allow waste to directly enter the environment; 2) any potential releases to air or water should be avoided; 3) use scrubbers to reduce emission to air
Risk Characterization Ratios (RCR) for the Purposes of Environment-Related Scaling	<p>RCR for Local Fresh Water Compartment 0.097  based on the maximum allowable release, the following RCRs are determined:</p> <p>RCR for Local Sea Water Compartment 0.097  RCR for Local Fresh-Water Sediment Compartment 0.97  RCR for Local Marine-Water Sediment Compartment 0.97  RCR for Local Soil Compartment 0.2</p>

<b>Exposure Estimation and Risk Characterizations Methods</b>
<b>Health</b>
CEFIC Chemical Safety Assessment Template tool (www.cefic.org) modified with using ECETOC Targeted Risk Assessment model exposure estimates (www.ecetoc.org).
<b>Environment</b>
EUSES 2.1.1 in combination site-specific analysis of phenol, dodecyl-, branched wastewater effluent.
<b>Guidance to check compliance with the Exposure Scenario and Scaling</b>
Guidance is based on assumed operating conditions which may not be applicable to all sites: thus scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Further details on scaling opportunities for downstream users are presented in the REACH Practical Guide on Exposure Assessment and Communication in the Supply Chains. Parts I and IV: (www.cefic.org).

## 1.2. Human Health Exposure Estimation – Exposure Scenario 1 – Industrial manufacture

### Acute Exposure Estimation

Acute occupational exposure to phenol, dodecyl-, branched can occur by the inhalation route or through dermal contact. Oral exposure is not a relevant route for the industrial occupational setting under REACH. In the absence of acute inhalation exposure data, EChA guidance (Chapter R14-4) recommends utilizing the highest PROC-predicted long-term exposure value, in this case 0.1 ppm, multiplied by a factor of 6. Thus, the highest expected acute inhalation exposure under the operational conditions and recommended risk management measures during the use of phenol, dodecyl-, branched during manufacturing is **6 ppm (predicted acute inhalation exposure)**. This value will be considered in a qualitative risk assessment (Section 10). Similarly, no acute dermal exposure data exists for this life-cycle stage. EChA guidance (Chapter R14-4) recommends utilizing the highest PROC-predicted long-term exposure value, in this case 0.03 mg/kg/day, multiplied by a factor of 6. Thus, the highest expected acute dermal exposure under the operational conditions and recommended risk management measures during the use of phenol, dodecyl-, branched as a monomer in the synthesis of polymers is **0.18 mg/kg (predicted acute dermal exposure)**. This value will be considered in a qualitative risk assessment (Section 10).

### Long-term Exposure Estimations.

Long-term occupational exposure estimations are based on industry-standardized processes and activities (contributing scenarios) linked to process categories (PROC) and assigned default values for inhalation and dermal exposure by the ECETOC TRA tool. Risk management measures exposure reduction factors have been applied where applicable per the ECETOC TRA tool and CEFIC Standard Phrase Library guidance.

**Table 2. Human Health Exposure Estimation – Exposure Scenario 1**

ES#	Short Title	Process Cat.	TRA Predicted Exposure (ppm) no modifier	Inhalation exposure RMM reduction	Dilution ventilation effectiveness	TRA conc. factor	TRA duration of inhalation exposure factor	ECETOC Predicted Inhalation Exposure (ppm) -	TRA Predicted Dermal exposure (mg/kg/d) -	TRA Dermal exposure RMM reduction	PPE factor	Predicted Dermal Exposure (mg/kg/d) - modified
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Phenol, dodecyl-, branched

				factor				modified	no modifiers	factor		
ES1-1	General exposures (closed systems) [CS15].	PROC 1	0.01		30% dilution outdoors	>25%	>4 hours	0.007	0.34		Chemically resistant gloves basic training– 90% reduction (0.1)	0.034
ES1-2	Process sampling [CS2].	PROC 1	0.01		30% dilution outdoors	>25%	<15 min (0.1)	0.0007	0.34	Local exhaust ventilation (LEV) - 90 % (0.1)		0.034
ES1-3	Bulk transfers [CS14].	PROC 8b	5	half mask, 90% (0.1)	Local exhaust ventilation (LEV) - 90 % (0.1)	>25%	<15 min (0.1)	0.015	0.6857	Local exhaust ventilation (LEV) - 90 % (0.1)	Chemically resistant gloves with specific activity training and intensive management supervisory controls– 98% reduction (0.02)	0.003
ES1-4	Drum and small package filling [CS6].	PROC 8b	5	half mask, 90% (0.1)	Local exhaust ventilation (LEV) - 90 % (0.1)	>25%	1-4 hours (0.6)	0.0030	0.6587		Chemically resistant gloves with specific activity training and intensive management supervisory controls– 98% reduction (0.02)	0.03
ES1-5	Equipment maintenance [CS5].	PROC 8b	5	half mask, 90% (0.1)	Local exhaust ventilation (LEV) - 90 % (0.1)	>25%	1-4 hours (0.6)	0.003	0.6587		Chemically resistant gloves with specific activity training and intensive management supervisory controls– 98% reduction (0.02)	0.03

Phenol, dodecyl-, branched

ES1-6	Laboratory activities [CS36].	PROC 15	5		Local exhaust ventilation (LEV) - 97 % (0.1)	>25%	15 min-1 hour (0.2)	0.1	0.0343	Local exhaust ventilation (LEV) - 90 % (0.1)		0.0034
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### 1.3. Environmental Exposure Estimation – Exposure Scenario 1 – Industrial Manufacture

The maximum acceptable emission to air and waste water from formulating and processing at a local site have been calculated.

It was assumed as a worst case that no STP is employed.

Emissions to freshwater will be considered acceptable if the  $PEC_{local, freshwater}$  when divided by the river dilution rate is less than the  $PNEC_{freshwater}$  value of 0.074 ug/L.

#### Environmental surrounding characteristics

A scaling scenario is presented that might serve as input to derive the safe conditions at a manufacturing sites. Manufacturing of this substance as a monomer for the synthesis of polymers occurs under highly contained processes in modern large manufacturing facilities. Operational systems are to be designed and documented for management control of waste and minimization of exposure and accident or spill prevention. Preventive maintenance systems are designed to maximize equipment utilization and efficiency including all environmental controls. Releases to the environment are also subject to local and regional in compliance with permit levels and regulations (e.g., IPPC directive, SEVESO II, DREAL).

Phenol, dodecyl-, branched

**Table 3. Exposure Scenario 1- Local PEC Outputs Calculated Based on the inputs into EUSES 2.1.1.**

The standard assumption is that a manufacturing site at the generic local scenario conditions emits 1.8 ug/L to the local STP which equates to 0.0035 kg/d.

Compartment	PEC
Local PEC in surface water during emission episode (dissolved) (mg/L)	7.21 E-6
Local PEC in sea water during emission episode (dissolved) (mg/L)	7.21E-07
Local PEC in fresh-water sediment during emission episode (mg/kg dwt)	0.12
Local PEC in marine sediment during emission episode (mg/kg dwt)	0.012
Local PEC in agricultural soil (total) averaged over 180 days (mg/kg dwt)	0.02

## 2. Exposure Scenario 2: Industrial use of substance as a monomer in the synthesis of polymers

### 2.1. Exposure Scenario 2

**Table 4. Exposure Scenario 2**

Exposure Scenario (ES) Industrial use of substance as a monomer in the synthesis of polymers	
<b>Substance</b>	
Phenol, dodecyl-, branched EC# 310-154-3 ; CAS# 121158-58-5	
<b>Use Descriptors</b>	
Sector of use	SU 3,8
Process Categories	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b, PROC 15
Environmental Release Categories	ERC 6c
Specific Environmental Release Category	ESVOC SpERC 4.20.v1 – 43: Manufacture of polymers from monomers in continuous and batch processes, include sparging, discharging, and reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing).
<b>Processes, tasks, activities covered</b>	
<ul style="list-style-type: none"> <li>• Receipt of raw materials; off-loading, transfer and sampling</li> <li>• Charging of reaction vessels; solid and liquid materials including addition of filter aids</li> <li>• Filtering and further processing; operation of solids filtering equipment</li> <li>• Sampling and QA; Process sampling</li> <li>• Sampling and QA; laboratory activities sampling</li> <li>• Transfer to transport container from storage or reaction vessel through fixed pipes or flexible hoses; bulk transfer, drum/batch transfers</li> <li>• Equipment maintenance and cleaning</li> </ul>	



Phenol, dodecyl-, branched

<ul style="list-style-type: none"> <li>Waste collection and disposal including raw material containers</li> <li>Storage</li> </ul>	
<b>Operational Conditions and Risk Management Measures</b>	
<b>Control of Worker Exposure</b>	
<b>Product Characteristics</b>	
Physical form of product	liquid
Vapor pressure	< 0.1 Pa
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Other Operational Conditions affecting exposure	Operations may be carried out at elevated temperature (>20C above ambient) [OC7]. Assumes a good basic standard of occupational hygiene is implemented [G1]. Assume a good standard of general ventilation (5-15 air exchanges/hour).
<b>Contributing Scenario</b>	<b>Specific Risk Management Measures (RMM) and Operational Conditions (OC) - <i>only required controls to demonstrate safe use listed</i></b>
General measures Relevant R-phrases: R36- Irritating to eyes and skin; R62 – possible risk of impaired fertility	Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training [PPE16]. Wear coveralls and eye protection. Contain and dispose of waste according to local regulations [C&H14].
Receipt of raw materials; off-loading, transfer and sampling	Avoid carrying out operation for more than 4 hours [OC11]. Wear chemically resistant gloves with specific activity training and intensive management supervisory controls.
Charging of reaction vessels; solid and liquid materials including addition of filter aids. Closed system process.	Handle substance within a closed system [E47].
Charging of reaction vessels; solid and liquid materials including addition of filter aids. Enclosed process with occasional controlled exposure.	Provide extract ventilation to points where emissions occur [E54].
Filtering and further processing; operation of solids filtering equipment	Provide extract ventilation to points where emissions occur [E54].
Transfer to transport container from storage or reaction vessel through fixed pipes or flexible hoses. Bulk or drum transfers.	Avoid carrying out operation for more than 4 hours [OC11]. Wear chemically resistant gloves with specific activity training and intensive management supervisory controls.
Process sampling	No additional risk management measures identified.
Laboratory activities	Handle in a fume cupboard or under extract ventilation [E83].
Equipment maintenance and cleaning	Avoid carrying out operation for more than 4 hours [OC11]. Clear lines prior to decoupling. Drain down

Phenol, dodecyl-, branched

	and flush system prior to equipment break-in or maintenance [E55].
Waste collection and disposal including raw material containers	Avoid carrying out operation for more than 4 hours [OC11].] Wear chemically resistant gloves with specific activity training and intensive management supervisory controls.
Storage; closed containment.	Handle substance within a closed system [E47].
Storage; closed system with occasional controlled exposure.	Handle substance within a closed system [E47]. Provide extract ventilation to points where emissions occur [E54].
<b>Control of environmental exposure</b>	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2000
Fraction of regional tonnage used locally	1
Annual site tonnage (tonnes/year)	20000
Maximum daily site tonnage --MES (kg/day)	73333
Fraction of substance in product -- CES	1
Frequency and duration of use	
Emission days -- Tmission (days/year)	300
<b>Environmental factors not influenced by risk management</b>	
Local freshwater dilution factor	40
Local marine water dilution factor	100
<b>Other given Operational Conditions affecting environmental exposure</b>	
On-site implementation of monitoring program for the presence of phenol, dodecyl-, branched in wastewater effluent or surrogate monitoring water quality for permit compliance (e.g., total hydrocarbon); Use of primary and secondary and biological treatment before discharge to surface water or STP.	
Release fraction to air from process (initial release prior to RMM)	2E-03 (ESVOC SpERC 4.20.v1)
Release fraction to wastewater from process (initial release prior to RMM)	2E-05 (ESVOC SpERC 4.20.v1)
Release fraction to soil from process (initial release prior to RMM)	Direct emissions to industrial soil during the use of the substance as a monomer for the synthesis of polymer is considered negligible under recommended operational conditions.
Technical conditions and measures at process level (source) to prevent release	
Carry out processes under high contained operating conditions. Implement a leak prevention program. Avoid using substance in aqueous processes.	
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	
Treat air emissions to provide a typical removal efficiency	Under the recommended operational conditions, air emissions to the atmosphere (as calculated by EUSES 2.1.1) do not require specific treatment. No measures beyond compliance with applicable local permitting standards are required to protect the air environment.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%) – fabatement, water	>90%

Phenol, dodecyl-, branched

If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency (%) - fabatement, water	>90%
Maximum allowable emissions to surface water or municipal STP is 0.0128 kg/day which equates to 0.00639 mg/L.	
<b>Organizational measures to prevent/limit release from site</b>	
Prevent releases to the environment. Use substance under contained conditions in non-aqueous processes. Monitor concentration in wastewater effluent. Prevent discharge of undissolved substance to, or recover from, wastewater [OMS1]. Do not apply industrial WWTP sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
<b>Conditions and measures related to municipal sewage treatment plant</b>	
Estimated substance removal from wastewater via domestic sewage treatment (%) - FSTP	91.1% - mainly due to sorption to STP sludge
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant RMMs (%))	>90%
Assumed domestic sewage treatment plant flow (m3/day)	2000
<b>Risk Characterization Ratios (RCR) for the Purposes of Environment-Related Scaling</b>	
Freshwater aquatic – 0.018 Freshwater sediment – 0.18 Marine water – 0.09 Marine sediment – 0.9 Soil - 0.21	
<b>Conditions and measures related to external treatment and recovery of waste for disposal</b>	
1) do not allow waste to directly enter the environment; 2) any potential releases to air or water should be avoided; 3) waste waters should be directed to a STP; 4) use scrubbers to reduce emission to air; 5) for formulation, use onsite primary and secondary treatments (including ultrafiltration, oil water separation, and biological treatment) before discharge to STP; 6) prevent discharge of undissolved substance to environment or recover from wastewater; 7) do not apply industrial sludge to natural soils; 8) incinerate sludge, contain or reclaim; 9) waste oil should either be recycled or incinerated.	
<b>Exposure Estimation and Risk Characterizations Methods</b>	
<b>Health</b>	
CEFIC Chemical Safety Assessment Template tool ( <a href="http://www.cefic.org">www.cefic.org</a> ) modified with using ECETOC Targeted Risk Assessment model exposure estimates ( <a href="http://www.ecetoc.org">www.ecetoc.org</a> ) in combination with ATIEL-ATC lubricant use group descriptors ( <a href="http://www.atiel.org">www.atiel.org</a> ).	
<b>Environment</b>	
EUSES 2.1.1 in combination with solvent industry (ESVOC) Specific Environmental Release Class (spERC) estimates ( <a href="http://www.cefic.org">www.cefic.org</a> ) and site-specific analysis of phenol, dodecyl-, branched wastewater effluent.	
<b>Guidance to check compliance with the Exposure Scenario and Scaling</b>	
Guidance is based on assumed operating conditions which may not be applicable to all sites: thus scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or	

in combination [DSU2]. Further details on scaling opportunities for downstream users are presented in the REACH Practical Guide on Exposure Assessment and Communication in the Supply Chains. Parts I and IV: ([www.cefic.org](http://www.cefic.org)).

## 2.2. Human Health Exposure Estimation – Exposure Scenario 2 Use of monomer for the synthesis of polymers.

### Acute Exposure Estimation

Acute occupational exposure to phenol, dodecyl-, branch can occur by the inhalation route or through dermal contact. Oral exposure is not a relevant route for the industrial occupational setting under REACH. Use of this substance as a monomer in the production of polymers occurs until highly contained operational conditions that minimize release into air within the worker breathing zone. In the absence of acute inhalation exposure data, EChA guidance (Chapter R14-4) recommends utilizing the highest PROC-predicted long-term exposure value, in this case 0.07 ppm, multiplied by a factor of 6. Thus, the highest expected acute inhalation exposure under the operational conditions and recommended risk management measures during the use of phenol, dodecyl-, branch as a monomer in the synthesis of polymers is **0.42 ppm (predicted acute inhalation exposure)**. This value will be considered in a qualitative risk assessment (Section 10). Similarly, no acute dermal exposure data exists for this substance for this life-cycle stage. EChA guidance (Chapter R14-4) recommends utilizing the highest PROC-predicted long-term exposure value, in this case 0.014 mg/kg/day, multiplied by a factor of 6. Thus, the highest expected acute dermal exposure under the operational conditions and recommended risk management measures during the use of phenol, dodecyl-, branch as a monomer in the synthesis of polymers is **0.84 mg/kg (predicted acute dermal exposure)**. This value will be considered in a qualitative risk assessment (Section 10).

### Long-term Exposure Estimations.

Long-term occupational exposure estimations are based on industry-standardized processes and activities (contributing scenarios) linked to process categories (PROC) and assigned default values for inhalation and dermal exposure by the ECETOC TRA tool. Risk management measures exposure reduction factors have been applied where applicable per the ECETOC TRA tool and CEFIC Standard Phrase Library guidance.

The ECETOC TRA tool used to predict occupational inhalation exposure based on historical EASE algorithms (EASE, 2003). The EASE algorithm uses a “banding structure” which for any given substance is assigned a tendency to become airborne somewhere in the spectrum ‘high–medium–low’ based on physical form, volatility and certain operational conditions. Use of this substance as a monomer in the production of polymers occurs until highly contained operational conditions that minimize release into air within the worker breathing zone. Following the EASE algorithm, phenol, dodecyl-, branched (vapor pressure 0.011 Pa) indicates this substance has a very low propensity to enter the worker breathing zone. Thus, the estimated EASE prediction for long-term occupational inhalation exposure all PROCs to be in the lowest exposure band, i.e., 0.1 ppm. This is considered a valid approach as the EASE algorithm is known to over predict exposures in some instances (EASE Model 2.0; Friar T.J., 2005; Hughson G.W., 2005a; Hughson G.W., 2005b; Elliott, L.J., 2007). Based on the properties and highly contained use of this substance, the probability of direct exposure is very low. Therefore using 0.1 ppm for inhalation exposure concentration derived from the EASE model was considered to be a safe and conservative approach for this life-cycle stage.

**Table 5. Human Health Exposure Estimation – Exposure Scenario 2**

ES#	Short Title	Process Category	TRA Predicted Long-term Inhalation Exposure (ppm) - no exposure modifiers	Inhalation exposure RMM reduction factor	Dilution ventilation effectiveness	TRA conc. factor	TRA duration of inhalation exposure factor	ECETOC Predicted Long-term Inhalation Exposure (ppm) – with RMM modifications	TRA Predicted Long-term Dermal exposure (mg/kg/d) – no exposure modifiers	TRA Dermal exposure RMM reduction factor	TRA conc. factor	PPE factor	ECETOC Predicted Long-term Dermal Exposure (ppm) – with RMM modifications
ES2	Industrial use of substance as a monomer in the synthesis of polymers												
ES2-W1	Charging of reaction vessels; solid and liquid materials including addition of filter aids. Closed system process.	PROC 1	0.01	N/A	N/A	>25%	>4 hours	<b>0.01</b>	0.34	N/A	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.034</b>
ES2-W2	Storage; closed containment.	PROC 1	0.01	N/A	N/A	>25%	>4 hours	<b>0.01</b>	0.34	N/A	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.034</b>
ES2-W3	Charging of reaction vessels; solid and liquid materials	PROC 2	0.1	Local exhaust ventilation (LEV) - 90 % (0.1)	N/A	>25%	>4 hours	<b>0.01</b>	1.37	Local exhaust ventilation (LEV) - 90 % (0.1)	>25%	Chemically resistant gloves with basic training – 90% reduction	<b>0.014</b>

Phenol, dodecyl-, branched

ES#	Short Title	Process Category	TRA Predicted Long-term Inhalation Exposure (ppm) - no exposure modifiers	Inhalation exposure RMM reduction factor	Dilution ventilation effectiveness	TRA conc. factor	TRA duration of inhalation exposure factor	ECETOC Predicted Long-term Inhalation Exposure (ppm) – with RMM modifications	TRA Predicted Long-term Dermal exposure (mg/kg/d) – no exposure modifiers	TRA Dermal exposure RMM reduction factor	TRA conc. factor	PPE factor	ECETOC Predicted Long-term Dermal Exposure (ppm) – with RMM modifications
	including addition of filter aids. Enclosed process with occasional controlled exposure. Local exhaust ventilation (LEV).											(0.1)	
ES2-W4	Equipment maintenance and cleaning.	PROC 2	0.1	N/A	30% (0.7)	>25%	1-4 hours (0.6)	<b>0.042</b>	1.37	N/A	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.14</b>
ES2-W5	Storage; closed system with occasional controlled exposure.	PROC 2	0.1	N/A	30% (0.7)	>25%	1-4 hours (0.6)	<b>0.042</b>	1.37	N/A	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.14</b>
ES2-W6	Charging of reaction vessels;	PROC 3	0.1	Local exhaust ventilation	N/A	>25%	>4 hours	<b>0.01</b>	0.34	Local exhaust ventilation	>25%	Chemically resistant gloves with	<b>0.003</b>

Phenol, dodecyl-, branched

ES#	Short Title	Process Category	TRA Predicted Long-term Inhalation Exposure (ppm) - no exposure modifiers	Inhalation exposure RMM reduction factor	Dilution ventilation effectiveness	TRA conc. factor	TRA duration of inhalation exposure factor	ECETOC Predicted Long-term Inhalation Exposure (ppm) – with RMM modifications	TRA Predicted Long-term Dermal exposure (mg/kg/d) – no exposure modifiers	TRA Dermal exposure RMM reduction factor	TRA conc. factor	PPE factor	ECETOC Predicted Long-term Dermal Exposure (ppm) – with RMM modifications
	solid and liquid materials including addition of filter aids. Enclosed process with occasional controlled exposure. Local exhaust ventilation (LEV).			(LEV) - 90 % (0.1)						(LEV) - 90 % (0.1)		basic training – 90% reduction (0.1)	
ES2-W7	Process sampling for QA.	PROC 3	0.1	N/A	30% (0.7)	>25%	> 4 hours	<b>0.07</b>	0.34	N/A	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.034</b>
ES2-W8	Operation of solids filtering equipment [CS117]	PROC 4	0.1	Local exhaust ventilation (LEV) - 90 % (0.1)	N/A	>25%	>4 hours	<b>0.01</b>	0.69	Local exhaust ventilation (LEV) - 90 % (0.1)	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.007</b>

Phenol, dodecyl-, branched

ES#	Short Title	Process Category	TRA Predicted Long-term Inhalation Exposure (ppm) - no exposure modifiers	Inhalation exposure RMM reduction factor	Dilution ventilation effectiveness	TRA conc. factor	TRA duration of inhalation exposure factor	ECETOC Predicted Long-term Inhalation Exposure (ppm) – with RMM modifications	TRA Predicted Long-term Dermal exposure (mg/kg/d) – no exposure modifiers	TRA Dermal exposure RMM reduction factor	TRA conc. factor	PPE factor	ECETOC Predicted Long-term Dermal Exposure (ppm) – with RMM modifications
ES2-W9	Receipt of raw materials; off-loading, transfer and sampling.	PROC 8b	0.1	N/A	30% (0.7)	>25%	1-4 hours (0.6)	<b>0.042</b>	6.86	N/A	>25%	Chemically resistant gloves with specific activity training and intensive management supervisory controls– 98% reduction (0.02)	<b>0.14</b>
ES2-W10	Transfer to transport container from storage or reaction vessel through fixed pipes or flexible hoses. Bulk or drum transfers.	PROC 8b	0.1	N/A	30% (0.7)	>25%	1-4 hours (0.6)	<b>0.042</b>	6.86	N/A	>25%	Chemically resistant gloves with specific activity training and intensive management supervisory controls– 98% reduction (0.02)	<b>0.14</b>
ES2-W11	Equipment cleaning and maintenance [CS39].	PROC 8b	0.1	N/A	30% (0.7)	>25%	> 4 hours	<b>0.07</b>	6.86	Drain down and flush before equipment break-in: 90%	>25%	Chemically resistant gloves with basic training – 90% reduction	<b>0.07</b>



Phenol, dodecyl-, branched

ES#	Short Title	Process Category	TRA Predicted Long-term Inhalation Exposure (ppm) - no exposure modifiers	Inhalation exposure RMM reduction factor	Dilution ventilation effectiveness	TRA conc. factor	TRA duration of inhalation exposure factor	ECETOC Predicted Long-term Inhalation Exposure (ppm) – with RMM modifications	TRA Predicted Long-term Dermal exposure (mg/kg/d) – no exposure modifiers	TRA Dermal exposure RMM reduction factor	TRA conc. factor	PPE factor	ECETOC Predicted Long-term Dermal Exposure (ppm) – with RMM modifications
										reduction (0.1)		(0.1)	
ES2-W12	Disposal of wastes [CS28].	PROC 8b	0.1	N/A	30% (0.7)	>25%	1-4 hours (0.6)	<b>0.042</b>	6.86	N/A	>25%	Chemically resistant gloves with specific activity training and intensive management supervisory controls– 98% reduction (0.02)	<b>0.14</b>
ES2-W13	Laboratory activities [CS36].	PROC 15	0.1	Local exhaust ventilation (LEV) - 90 % (0.1)	N/A	>25%	> 4 hours	<b>0.01</b>	0.34	Local exhaust ventilation (LEV) - 90 % (0.1)	>25%	Chemically resistant gloves with basic training – 90% reduction (0.1)	<b>0.003</b>

### 2.3. Environmental Exposure Estimation – Exposure Scenario 2

#### Environmental surroundings characteristics

Actual measurements of phenol, dodecyl-, branched in wastewater effluents from large industrial facilities which manufacture and process substance as a monomer into polymers are available (Brooke et al, 2007). An overall total combined emission from these processes (after on-site wastewater treatment including oil/water separation and biological treatment) estimates 4.67 kg/year of phenol, dodecyl-, branched release to wastewater effluent (surface water or municipal STP). This estimate is based on measurements made at two sites during periods when the substance manufacturing and polymerization reaction were in active. The measurements also included maintenance periods for the production process and when the substance was delivered to the facilities for use as intermediate/monomer. The data have been considered by Member State Competent Authorities as representative of substance released to wastewater effluent during the range of normal activities. Use of this substance as a monomer for the synthesis of polymers occurs under highly contained processes in modern large manufacturing facilities. Operational systems are to be designed and documented for management control of waste and minimization of exposure and accident or spill prevention. Preventive maintenance systems are designed to maximize equipment utilization and efficiency including all environmental controls. Wastewater treatment includes primary and secondary wastewater treatment that achieves >90% effectiveness. Releases to the environment are also subject to local and regional in compliance with permit levels and regulations (e.g., IPPC directive, SEVESO II, DREAL).

**Table 6. Exposure Scenario 2- Local PEC Outputs Calculated Based on the inputs into EUSES 2.1.1.**

Compartment	PEC
Local PEC in surface water during emission episode (dissolved) (mg/L)	1.35E-06
Local PEC in sea water during emission episode (dissolved) (mg/L)	6.67E-07
Local PEC in fresh-water sediment during emission episode (mg/kg dwt)	0.0225
Local PEC in marine sediment during emission episode (mg/kg dwt)	0.011
Local PEC in agricultural soil (total) averaged over 180 days (mg/kg dwt)	0.2