


**AlphaPlus® 1-Hexene (C6H12)**

Version 6.0

Revision Date 2011-08-12

**1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**
**Product information**

Trade name : AlphaPlus® 1-Hexene (C6H12)  
 Material : 10576539

**EC-No.Registration number**

| Chemical Name | CAS-No.<br>Index-No. | Legal Entity<br>Registration number                           |
|---------------|----------------------|---|
| 1-Hexene      | 592-41-6             | Chevron Phillips Chemical Company LP<br>01-2119475505-34-0005 |
| 1-Hexene      | 592-41-6             | Saudi Polymer Company<br>01-2119475505-34-0004                |

Relevant Identified Uses Supported : Manufacture  
 Distribution  
 Use as an intermediate  
 Formulation  
 Lubricants - Industrial  
 Lubricants - Professional  
 Lubricants - Consumer  
 Metal working fluids / rolling oils - Industrial  
 Metal working fluids / rolling oils – Professional  
 Use as a fuel - industrial  
 Use as a fuel – professional  
 Functional Fluids - Industrial  
 Functional Fluids - Professional  
 Use in polymer production – industrial

**Company** : Qatar Chemical Company LTD (QChem)  
 1st Floor Salam Tower Al Corniche  
 P.O. Box 24646  
 Doha, Qatar

MSDS Requests: (+974) 4484-7110  
 Technical Information: (+974) 4476-7676  
 Responsible Party: Product Safety Group  
 Email: MSDSInquiry@qchem.com.qa

**Local** : Chevron Phillips Chemicals International N.V.  
 Brusselsesteenweg 355  
 B-3090 Overijse  
 Belgium

MSDS Requests: (800) 852-5530  
 Technical Information: (832) 813-4862  
 Responsible Party: Product Safety Group

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Email:msds@cpchem.com

**Emergency telephone:****Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

**Transport:**

North America: CHEMTREC 800.424.9300 or 703.527.3887

Asia: +800 CHEMCALL (+800 2436 2255) China: 0532.8388.9090

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Chemcare Asia: Tel: +65 6848 9048 - Mob: +65 8382 9188 - Fax: +65 6848

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group  
 E-mail address : MSDS@CPChem.com  
 Website : www.CPChem.com

**2. HAZARDS IDENTIFICATION****Classification of the substance or mixture****Classification (REGULATION (EC) No 1272/2008)**

Flammable liquids, Category 2

Aspiration hazard, Category 1

H225: Highly flammable liquid and vapor.

H304: May be fatal if swallowed and enters airways.

**Classification (67/548/EEC, 1999/45/EC)**

Highly flammable

Harmful

Dangerous for the environment

R11: Highly flammable.

R65: Harmful: may cause lung damage if swallowed.

R66: Repeated exposure may cause skin dryness or cracking.

R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Label elements****Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H225 Highly flammable liquid and vapor.  
 H304 May be fatal if swallowed and enters airways.

Precautionary Statements : **Prevention:**  
 P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
 P243 Take precautionary measures against static discharge.  
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**

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P301 + P310 IF SWALLOWED: Immediately call a  
POISON CENTER or doctor/ physician.  
P331 Do NOT induce vomiting.  
**Storage:**  
P403 + P235 Store in a well-ventilated place. Keep cool.

Hazardous ingredients which must be listed on the label:

- 592-41-6 1-Hexene

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Synonyms : alpha-Hexene  
Hexene-1  
Hex-1-ene  
Hexylene  
NAO 6  
Butyl Ethylene  
C6H12

Molecular formula : C6H12

**Mixtures****Hazardous ingredients**

| Chemical Name    | CAS-No.<br>EINECS-No. | Classification<br>(67/548/EEC) | Classification<br>(REGULATION<br>(EC) No<br>1272/2008) | Concentration<br>[wt%] |
|------------------|-----------------------|--------------------------------|--|------------------------|
| 1-Hexene         | 592-41-6<br>209-753-1 | F-Xn-N; R11-R65-<br>R51/53-R66 | Asp. Tox. 1; H304<br>Flam. Liq. 2; H225                | 99 - 100               |
| 2-Ethyl-1-Butene | 760-21-4<br>212-078-5 |                                | Asp. Tox. 1; H304<br>Flam. Liq. 2; H225                | 1 - 5                  |

**EC-No.Registration number**

| Chemical Name | CAS-No.<br>EINECS-No. | Registration number   |
|---------------|-----------------------|-----------------------|
| 1-Hexene      | 592-41-6<br>209-753-1 | 01-2119475505-34-0005 |
|               |                       | 01-2119475505-34-0004 |

For the full text of the R-phrases mentioned in this Section, see Section 16.

For the full text of the H-Statements mentioned in this Section, see Section 16.

**4. FIRST AID MEASURES**

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Symptoms of poisoning may only appear several hours later. Do not leave the victim unattended.

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- |                         |   |   |
|-------------------------|---|---|
| If inhaled              | : | If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.   |
| In case of skin contact | : | If on skin, rinse well with water. If on clothes, remove clothes.   |
| In case of eye contact  | : | Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.   |
| If swallowed            | : | Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital. |

**5. FIRE-FIGHTING MEASURES**

- |  |   |  |
|--|---|--|
| Flash point                                    | : | -26 °C (-15 °F)<br>Method: closed cup  |
| Autoignition temperature                       | : | 272 °C (522 °F)  |
| Suitable extinguishing media                   | : | Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.  |
| Unsuitable extinguishing media                 | : | High volume water jet.   |
| Specific hazards during fire fighting          | : | Do not allow run-off from fire fighting to enter drains or water courses.  |
| Special protective equipment for fire-fighters | : | Wear self contained breathing apparatus for fire fighting if necessary.  |
| Further information                            | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers. |
| Fire and explosion protection                  | : | Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.  |
| Hazardous decomposition products               | : | No data available.   |

**6. ACCIDENTAL RELEASE MEASURES**

- |                      |   |  |
|----------------------|---|--|
| Personal precautions | : | Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to |
|----------------------|---|--|

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- form explosive concentrations. Vapors can accumulate in low areas.
- Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

**7. HANDLING AND STORAGE****Handling**

- Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.
- Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

**Storage**

- Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Ingredients with workplace control parameters****Chevron Phillips Chemical Company LP**

| Ingredients | Basis        | Value | Control parameters | Note |
|-------------|--------------|-------|--------------------|------|
| 1-Hexene    | Manufacturer | TWA   | 50 ppm,            |      |

**PT**

| Componentes | Bases  | Valor  | Parâmetros de controlo | Nota |
|-------------|--------|--------|------------------------|------|
| 1-Hexene    | PT OEL | VLE-MP | 50 ppm,                |      |

**BE**

| Bestanddelen | Basis  | Waarde   | Controleparameters | Opmerking |
|--------------|--------|----------|--------------------|-----------|
| 1-Hexene     | BE OEL | TGG 8 hr | 50 ppm, 175 mg/m3  |           |

**Personal protective equipment**

MSDS Number:100000068731

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- Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.
- Skin and body protection : Impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

**||** For additional details, see the Exposure Scenario in the Annex portion

**9. PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties****Appearance**

- Form : Liquid
- Physical state : Liquid
- Color : Clear, colorless

**Safety data**

- Flash point : -26 °C (-15 °F)  
Method: closed cup
- Lower explosion limit : 2 %(V)
- Upper explosion limit : 7 %(V)

- Oxidizing properties : No
- Autoignition temperature : 272 °C (522 °F)
- Molecular formula : C<sub>6</sub>H<sub>12</sub>
- Molecular Weight : 84,18 g/mol
- pH : Not applicable
- Pour point : No data available
- Boiling point/boiling range : 63,5 °C (146,3 °F)
- Vapor pressure : 176,00 MMHG  
at 24 °C (75 °F)
- 106,30 kPa  
at 65 °C (149 °F)
- Relative density : 0,68, 15 °C(59 °F)
- Density : 645 kg/m<sup>3</sup>  
at 50 °C (122 °F)
- 678 kg/m<sup>3</sup>

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|  |   |
|--|---|
|  | at 15 °C (59 °F)                                  |
|  | 674 g/cm <sup>3</sup><br>at 20 °C (68 °F)         |
| Water solubility                           | : 47 MG/L<br>at 20 °C (68 °F)<br>slightly soluble |
| Partition coefficient: n-<br>octanol/water | : log Pow: 3,87                                   |
| Viscosity, kinematic                       | : 0,34 cSt<br>at 40 °C (104 °F)                   |
| Relative vapor density                     | : 2,9<br>(Air = 1.0)                              |
| Evaporation rate                           | : No data available                               |
| Percent volatile                           | : > 99 %  |

**10. STABILITY AND REACTIVITY****Possibility of hazardous reactions**

|                     |   |
|---------------------|---|
| Conditions to avoid | : Heat, flames and sparks.  |
| Other data          | : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.<br>No decomposition if stored and applied as directed. |

**11. TOXICOLOGICAL INFORMATION****Acute oral toxicity**

|          |  |
|----------|--|
| 1-Hexene | : LD50: > 5.600 mg/kg<br>Species: rat<br>Sex: male and female<br>Method: Fixed Dose Method |
|----------|--|

**Acute inhalation toxicity**

|          |   |
|----------|---|
| 1-Hexene | : LC50: 110,1 mg/l<br>Exposure time: 4 HR<br>Species: rat<br>Sex: male<br>Method: OECD Test Guideline 403 |
|----------|---|

**Acute dermal toxicity**

|          |  |
|----------|--|
| 1-Hexene | : LD50: > 2.000 mg/kg<br>Species: rabbit<br>Sex: male and female |
|----------|--|

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**Skin irritation**

1-Hexene : No skin irritation  
Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin resulting in desiccation of the skin.

**Eye irritation**

1-Hexene : No eye irritation

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**Sensitization** : Did not cause sensitization on laboratory animals.

**Repeated dose toxicity**

1-Hexene : Species: rat, male  
Sex: male  
Application Route: oral gavage  
Dose: 0, 10, 101, 1010, 3365 mg/kg  
Exposure time: 28 day  
Number of exposures: daily  
NOEL: 101 mg/kg  
Lowest observable effect level: 1.010 mg/kg  
Test substance: yes  
Method: OECD Test Guideline 407

Species: rat, female  
Sex: female  
Application Route: oral gavage  
Dose: 0, 10, 101, 1010, 3365 mg/kg  
Exposure time: 28 day  
Number of exposures: daily  
NOEL: 1.010 mg/kg  
Lowest observable effect level: 3.365 mg/kg  
Test substance: yes  
Method: OECD Test Guideline 407

Species: rat  
Application Route: Inhalation  
Dose: 0, 300, 1000, 3000 ppm  
Exposure time: 90 day  
Number of exposures: 6 h/d, 5 d/wk, 13 wk  
NOEL: 3000 ppm  
Test substance: yes

**Reproductive toxicity**

1-Hexene : Species: rat  
Sex: males  
Application Route: oral gavage  
Dose: 0, 100, 500, 1000 mg/kg  
Number of exposures: daily  
Test period: 44 d  
Test substance: yes  
Method: OECD Guideline 421  
NOAEL Parent: 1.000 mg/kg  
NOAEL F1: 1.000 mg/kg

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Species: rat  
 Sex: females  
 Application Route: oral gavage  
 Dose: 0, 100, 500, 1000 mg/kg  
 Number of exposures: daily  
 Test period: 41-51 d  
 Test substance: yes  
 Method: OECD Guideline 421  
 NOAEL Parent: 1.000 mg/kg  
 NOAEL F1: 1.000 mg/kg

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**Aspiration toxicity** : May be fatal if swallowed and enters airways.  
 Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

**CMR effects**

1-Hexene : Carcinogenicity: Not available  
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.  
 Teratogenicity: Animal testing did not show any effects on fetal development.  
 Reproductive toxicity: Animal testing did not show any effects on fertility.

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**Further information** : Solvents may degrease the skin.

**12. ECOLOGICAL INFORMATION****Toxicity to fish**

1-Hexene : LC50: 5,6 mg/l  
 Exposure time: 96 HR  
 Species: Oncorhynchus mykiss (rainbow trout)  
 semi-static test Test substance: yes  
 Method: OECD Test Guideline 203

**Toxicity to daphnia and other aquatic invertebrates.**

1-Hexene : EC50: 4,4 mg/l  
 Exposure time: 48 HR  
 Species: Daphnia magna (Water flea)  
 static test Test substance: No  
 Method: OECD Test Guideline 202  
 Information given is based on data obtained from similar substances.

**Toxicity to algae**

1-Hexene : NOEC: 1,8 mg/l  
 Exposure time: 96 HR  
 Species: Pseudokirchneriella subcapitata (green algae)

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Growth inhibition Method: OECD Test Guideline 201  
Information given is based on data obtained from similar substances.

EC50: > 5,5 mg/l  
Exposure time: 96 HR  
Species: Pseudokirchneriella subcapitata (green algae)  
Growth inhibition Method: OECD Test Guideline 201  
Information given is based on data obtained from similar substances.

**Bioaccumulation**

1-Hexene : This material is not expected to bioaccumulate.

**Biodegradability**

1-Hexene : 67 - 98 %  
Testing period: 28 D  
Test substance: yes  
According to the results of tests of biodegradability this product is considered as being readily biodegradable.

**Further information on ecology****Results of PBT assessment**

1-Hexene : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : Toxic to aquatic life.  
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**13. DISPOSAL CONSIDERATIONS**

The information in this MSDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

**|| For additional details, see the Exposure Scenario in the Annex portion**

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**14. TRANSPORT INFORMATION**

**The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).**

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the MSDS and the bill of lading.

**US DOT (United States Department of Transportation)**

UN2370, 1-HEXENE, , 3, II

**IMO / IMDG (International Maritime Dangerous Goods)**UN2370, 1-HEXENE, , 3, II  
, (-26 °C)**IATA (International Air Transport Association)**

UN2370, 1-HEXENE, , 3, II

**ADR (Agreement on Dangerous Goods by Road (Europe))**

UN2370, 1-HEXENE, , 3, II, (D/E)

**RID (Regulations concerning the International Transport of Dangerous Goods (Europe))**

UN2370, 1-HEXENE, , 3, II

**ADN (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)**

UN2370, 1-HEXENE, , 3, II

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

**15. REGULATORY INFORMATION****National legislation**

**Major Accident Hazard Legislation** : 96/82/EC Update: 2003  
Highly flammable  
7b  
Quantity 1: 5.000 t  
Quantity 2: 50.000 t

**Water contaminating class (Germany)** : WGK 2 water endangering

**Notification status**

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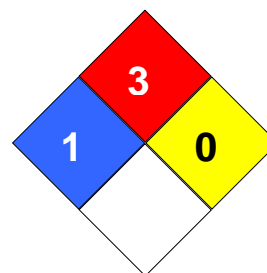
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|                                  |  |
|----------------------------------|--|
| Europe REACH                     | : On the inventory, or in compliance with the inventory        |
| United States of America US.TSCA | : On the inventory, or in compliance with the inventory        |
| Canada DSL                       | : All components of this product are on the Canadian DSL list. |
| Australia AICS                   | : On the inventory, or in compliance with the inventory        |
| New Zealand NZIoC                | : On the inventory, or in compliance with the inventory        |
| Japan ENCS                       | : On the inventory, or in compliance with the inventory        |
| Korea KECI                       | : On the inventory, or in compliance with the inventory        |
| Philippines PICCS                | : On the inventory, or in compliance with the inventory        |
| China IECSC                      | : On the inventory, or in compliance with the inventory        |

**16. OTHER INFORMATION**

**NFPA Classification** : Health Hazard: 1  
Fire Hazard: 3  
Reactivity Hazard: 0

**Further information**

Legacy MSDS Number : QCHEM009

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this MSDS pertains only to the product as shipped.

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Key or legend to abbreviations and acronyms used in the safety data sheet**

|       |   |       |   |
|-------|---|-------|---|
| ACGIH | American Conference of Government Industrial Hygienists | LD50  | Lethal Dose 50%                                     |
| AICS  | Australia, Inventory of Chemical Substances             | LOAEL | Lowest Observed Adverse Effect Level                |
| DSL   | Canada, Domestic Substances List                        | NFPA  | National Fire Protection Agency                     |
| NDSL  | Canada, Non-Domestic Substances List                    | NIOSH | National Institute for Occupational Safety & Health |
| CNS   | Central Nervous System                                  | NTP   | National Toxicology Program                         |
| CAS   | Chemical Abstract Service                               | NZIoC | New Zealand Inventory of Chemicals                  |
| EC50  | Effective Concentration                                 | NOAEL | No Observable Adverse Effect Level                  |
| EC50  | Effective Concentration 50%                             | NOEC  | No Observed Effect Concentration                    |
| EGEST | EOSCA Generic Exposure Scenario Tool                    | OSHA  | Occupational Safety & Health Administration         |
| EOSCA | European Oilfield Specialty Chemicals Association       | PEL   | Permissible Exposure Limit                          |

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|--------|--|-------|--|
| EINECS | European Inventory of Existing Chemical Substances       | PICCS | Philippines Inventory of Commercial Chemical Substances                              |
| MAK    | Germany Maximum Concentration Values                     | PRNT  | Presumed Not Toxic   |
| GHS    | Globally Harmonized System                               | RCRA  | Resource Conservation Recovery Act   |
| >=     | Greater Than or Equal To                                 | STEL  | Short-term Exposure Limit  |
| IC50   | Inhibition Concentration 50%                             | SARA  | Superfund Amendments and Reauthorization Act.  |
| IARC   | International Agency for Research on Cancer              | TLV   | Threshold Limit Value  |
| IECSC  | Inventory of Existing Chemical Substances in China       | TWA   | Time Weighted Average  |
| ENCS   | Japan, Inventory of Existing and New Chemical Substances | TSCA  | Toxic Substance Control Act  |
| KECI   | Korea, Existing Chemical Inventory                       | UVCB  | Unknown or Variable Composition, Complex Reaction Products, and Biological Materials |
| <=     | Less Than or Equal To                                    | WHMIS | Workplace Hazardous Materials Information System                                     |
| LC50   | Lethal Concentration 50%                                 |       |  |

**Full text of R-phrases referred to under sections 2 and 3**

|        |   |
|--------|---|
| R11    | Highly flammable.   |
| R51/53 | Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| R65    | Harmful: may cause lung damage if swallowed.  |
| R66    | Repeated exposure may cause skin dryness or cracking.                                       |

**Full text of H-Statements referred to under sections 2 and 3.**

|      |   |
|------|---|
| H225 | Highly flammable liquid and vapor.            |
| H304 | May be fatal if swallowed and enters airways. |

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**Annex****1. Short title of Exposure Scenario: Manufacture**

|                                |   |   |
|--------------------------------|---|---|
| Main User Groups               | : | <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites   |
| Sector of use                  | : | <b>SU3, SU8, SU9:</b> Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals  |
| Process category               | : | <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities<br><b>PROC15:</b> Use as laboratory reagent |
| Environmental release category | : | <b>ERC1, ERC4:</b> Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles  |
| Further information            | : | Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities  |

**ERC1, ERC4:****Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles****Product characteristics**

|   |   |  |
|---|---|--|
| Concentration of the Substance in Mixture/Article | : | Covers percentage substance in the product up to 100 % (unless stated differently) |
| (Msafe)   | : | 166,834 tonnes/day   |

**Environment factors not influenced by risk management**

|                                 |   |                          |
|---------------------------------|---|--------------------------|
| Flow rate                       | : | 18.000 m <sup>3</sup> /d |
| Dilution Factor (River)         | : | 40                       |
| Dilution Factor (Coastal Areas) | : | 100                      |

**Other given operational conditions affecting environmental exposure**

|                                   |   |        |
|-----------------------------------|---|--------|
| Number of emission days per year  | : | 300    |
| Emission or Release Factor: Air   | : | 5 %    |
| Emission or Release Factor: Water | : | 0,03 % |
| Emission or Release Factor: Soil  | : | 0,01 % |

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**Technical conditions and measures / Organizational measures**

|         |   |  |
|---------|---|--|
| Air     | : | Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 90 %)   |
| Water   | : | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\geq$ (%): (Effectiveness: 96,8 %) |
| Remarks | : | Prevent discharge of undissolved substance to or recover from wastewater.  |
| Remarks | : | Do not apply industrial sludge to natural soils.   |
| Remarks | : | Sludge should be incinerated, contained or reclaimed.  |

**Conditions and measures related to municipal sewage treatment plant**

|  |   |                         |
|--|---|-------------------------|
| Flow rate of sewage treatment plant effluent | : | 2.000 m <sup>3</sup> /d |
| Effectiveness (of a measure)                 | : | 96,8 %                  |

**Conditions and measures related to external treatment of waste for disposal**

|                 |   |   |
|-----------------|---|---|
| Waste treatment | : | External treatment and disposal of waste should comply with applicable local and/or national regulations. |
|-----------------|---|---|

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

**Product characteristics**

|   |   |  |
|---|---|--|
| Concentration of the Substance in Mixture/Article | : | Covers percentage substance in the product up to 100 % (unless stated differently) |
| Remarks   | : | Liquid, vapour pressure > 10 kPa at STP  |

**Amount used**

|         |   |                |
|---------|---|----------------|
| Remarks | : | Not applicable |
|---------|---|----------------|

**Frequency and duration of use**

|         |   |  |
|---------|---|--|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently) |
|---------|---|--|

**Other operational conditions affecting workers exposure**

|         |   |  |
|---------|---|--|
| Remarks | : | Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently. |
|---------|---|--|

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

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| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC1, ERC4            | EUSES                      |                     | Freshwater          |            | 0,0201 mg/L       | 0,181                                   |
|                       |                            |                     | Marine water        |            | 0,0080 mg/L       | 0,0722                                  |
|                       |                            |                     | Soil                |            | 3,54 mg/kg        | 0,999                                   |
|                       |                            |                     | Freshwater sediment |            | 0,809 mg/kg       | 0,193                                   |
|                       |                            |                     | Marine sediment     |            | 0,323 mg/kg       | 0,0772                                  |
|                       |                            |                     | Air                 |            | 0,232 mg/m3       |   |

ERC1: Manufacture of substances

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

**1. Short title of Exposure Scenario: Distribution**

|                                |  |
|--------------------------------|--|
| Main User Groups               | : <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites  |
| Sector of use                  | : <b>SU3:</b> Industrial Manufacturing (all)   |
| Process category               | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities<br>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)<br><b>PROC15:</b> Use as laboratory reagent |
| Environmental release category | : <b>ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7:</b> Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture  |

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Further information : of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems : Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

**ERC1, ERC2, ERC3,**

**ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems**

**Product characteristics**

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

(Msafe) : 5.011,707 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d

Dilution Factor (River) : 10

Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 365

Emission or Release Factor: Air : 0,1 %

Emission or Release Factor: Water : 0,001 %

Emission or Release Factor: Soil : 0,001 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 90 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%) (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d

Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3,**

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**PROC4, PROC8a, PROC8b,, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario  | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|--|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 | EUSES                      |                     | Freshwater          |            | 0,0014 mg/L       | 0,0123                                  |
|  |                            |                     | Marine water        |            | 0,135 µg/L        | 0,00122                                 |
|  |                            |                     | Soil                |            | 0,0581 mg/kg      | 0,0164                                  |
|  |                            |                     | Freshwater sediment |            | 0,055 mg/kg       | 0,0131                                  |
|  |                            |                     | Marine sediment     |            | 0,0055 mg/kg      | 0,0013                                  |
|  |                            |                     | Air                 |            | 0,0023 mg/m3      |   |

ERC1: Manufacture of substances  
ERC2: Formulation of preparations  
ERC3: Formulation in materials  
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles  
ERC5: Industrial use resulting in inclusion into or onto a matrix  
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)  
ERC6b: Industrial use of reactive processing aids  
ERC6c: Industrial use of monomers for manufacture of thermoplastics

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ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers  
 ERC7: Industrial use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

**1. Short title of Exposure Scenario: Use as an intermediate**

|                                |   |
|--------------------------------|---|
| Main User Groups               | : <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites   |
| Sector of use                  | : <b>SU3, SU8, SU9:</b> Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals  |
| Process category               | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities<br><b>PROC15:</b> Use as laboratory reagent |
| Environmental release category | : <b>ERC6a:</b> Industrial use resulting in manufacture of another substance (use of intermediates)   |
| Further information            | : Use as an isolated intermediate under strictly controlled conditions  |

**ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)****Product characteristics**

|   |  |
|---|--|
| Concentration of the Substance in Mixture/Article | : Covers percentage substance in the product up to 100 % (unless stated differently) |
| (Msafe)   | : 166,837 tonnes/day   |

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**Environment factors not influenced by risk management**

Flow rate : 18.000 m<sup>3</sup>/d  
 Dilution Factor (River) : 10  
 Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300  
 Emission or Release Factor: Air : 2,5 %  
 Emission or Release Factor: Water : 0,03 %  
 Emission or Release Factor: Soil : 0,1 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 80 %)  
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%) (Effectiveness: 96,8 %)  
 Remarks : Prevent discharge of undissolved substance to or recover from wastewater.  
 Remarks : Do not apply industrial sludge to natural soils.  
 Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m<sup>3</sup>/d  
 Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

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

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

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**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC6a                 | EUSES                      |                     | Freshwater          |            | 0,0081 mg/L       | 0,0726                                  |
|                       |                            |                     | Marine water        |            | 0,805 µg/L        | 0,00725                                 |
|                       |                            |                     | Soil                |            | 0,354 mg/kg       | 0,0999                                  |
|                       |                            |                     | Freshwater sediment |            | 0,325 mg/kg       | 0,0776                                  |
|                       |                            |                     | Marine sediment     |            | 0,0324 mg/kg      | 0,00775                                 |
|                       |                            |                     | Air                 |            | 0,0232 mg/m3      |   |

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

**1. Short title of Exposure Scenario: Formulation**

|                  |  |
|------------------|--|
| Main User Groups | : <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites  |
| Sector of use    | : <b>SU3, SU 10:</b> Industrial Manufacturing (all), Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)  |
| Process category | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated |

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facilities  
 : Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
**PROC14:** Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;  
**PROC15:** Use as laboratory reagent

Environmental release category : **ERC2:** Formulation of preparations  
 Further information : Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

**preparations****ERC2: Formulation of****Product characteristics**

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

(Msafe) : 248,014 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d  
 Dilution Factor (River) : 10  
 Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300  
 Emission or Release Factor: Air : 2,5 %  
 Emission or Release Factor: Water : 0,02 %  
 Emission or Release Factor: Soil : 0,01 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)  
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)  
 Remarks : Prevent discharge of undissolved substance to or recover from wastewater.  
 Remarks : Do not apply industrial sludge to natural soils.  
 Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d  
 Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b,, PROC14, PROC15: Use in closed process, no likelihood of**

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**exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;, Use as laboratory reagent**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC2                  | EUSES                      |                     | Freshwater          |            | 0,0268 mg/L       | 0,241                                   |
|                       |                            |                     | Marine water        |            | 0,0027 mg/L       | 0,0241                                  |
|                       |                            |                     | Soil                |            | 1,19 mg/kg        | 0,336                                   |
|                       |                            |                     | Freshwater sediment |            | 1,08 mg/kg        | 0,258                                   |
|                       |                            |                     | Marine sediment     |            | 0,108 mg/kg       | 0,0258                                  |
|                       |                            |                     | Air                 |            | 0,579 mg/m3       |   |

ERC2: Formulation of preparations

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

**1. Short title of Exposure Scenario: Lubricants - Industrial**

|                                |   |
|--------------------------------|---|
| Main User Groups               | : <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites   |
| Sector of use                  | : <b>SU3:</b> Industrial Manufacturing (all)  |
| Process category               | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC7:</b> Industrial spraying<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities<br>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)<br><b>PROC10:</b> Roller application or brushing<br><b>PROC13:</b> Treatment of articles by dipping and pouring<br><b>PROC17:</b> Lubrication at high energy conditions and in partly open process<br><b>PROC18:</b> Greasing at high energy conditions |
| Environmental release category | : <b>ERC4, ERC7:</b> Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems   |
| Further information            | : Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.  |

**ERC4, ERC7:****Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems****Product characteristics**

|   |  |
|---|--|
| Concentration of the Substance in Mixture/Article | : Covers percentage substance in the product up to 100 % (unless stated differently) |
| (Msafe)   | : 805,271 tonnes/day   |

**Environment factors not influenced by risk management**

|           |                            |
|-----------|----------------------------|
| Flow rate | : 18.000 m <sup>3</sup> /d |
|-----------|----------------------------|

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Dilution Factor (River) : 10  
 Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300  
 Emission or Release Factor: Air : 0,1 %  
 Emission or Release Factor: Water : 0,003 %  
 Emission or Release Factor: Soil : 0,1 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 70 %)  
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%) (Effectiveness: 96,8 %)  
 Remarks : Prevent discharge of undissolved substance to or recover from wastewater.  
 Remarks : Do not apply industrial sludge to natural soils.  
 Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m<sup>3</sup>/d  
 Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b,, PROC10, PROC13, PROC17, PROC18: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Industrial spraying, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above

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ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure       | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------------|---|
| ERC4, ERC7            | EUSES                      |                     | Freshwater          |            | 0,071 µg/L              | 0,0006                                  |
|                       |                            |                     | Marine water        |            | 0,0063 µg/L             | 0,00006                                 |
|                       |                            |                     | Soil                |            | 0,001 mg/kg             | 0,00032                                 |
|                       |                            |                     | Freshwater sediment |            | 0,0029 mg/kg            | 0,0007                                  |
|                       |                            |                     | Marine sediment     |            | 0,254 µg/kg             | 0,00006                                 |
|                       |                            |                     | Air                 |            | 0,447 µg/m <sup>3</sup> |   |

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

ERC7: Industrial use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

**1. Short title of Exposure Scenario: Lubricants - Professional**

|                  |  |
|------------------|--|
| Main User Groups | : <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)   |
| Sector of use    | : <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)   |
| Process category | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |

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|                                |   |
|--------------------------------|---|
|                                | <p><b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</p> <p>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p><b>PROC10:</b> Roller application or brushing</p> <p><b>PROC11:</b> Non industrial spraying</p> <p><b>PROC13:</b> Treatment of articles by dipping and pouring</p> <p><b>PROC17:</b> Lubrication at high energy conditions and in partly open process</p> <p><b>PROC18:</b> Greasing at high energy conditions</p> <p><b>PROC20:</b> Heat and pressure transfer fluids in dispersive, professional use but closed systems</p> |
| Environmental release category | : <b>ERC8a, ERC8d, ERC9a, ERC9b:</b> Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems   |
| Further information            | : Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.   |

**ERC8a, ERC8d,**

**ERC9a, ERC9b: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems**

**Product characteristics**

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

(Msafe) : 0,873 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m<sup>3</sup>/d

Dilution Factor (River) : 10

Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300

Emission or Release Factor: Air : 60 %

Emission or Release Factor: Water : 5 %

Emission or Release Factor: Soil : 5 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

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Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d  
Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b,, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20:**  
Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process, Greasing at high energy conditions, Heat and pressure transfer fluids in dispersive, professional use but closed systems

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|-------------|------------|-------------------|---|
| ERC8a, ERC8d,         | EUSES                      |                     | Freshwater  |            | 0,131 µg/L        | 0,00118                                 |

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|              |  |  |                     |  |                         |          |
|--------------|--|--|---------------------|--|-------------------------|----------|
| ERC9a, ERC9b |  |  |                     |  |                         |          |
|              |  |  | Marine water        |  | 0,0123 µg/L             | 0,00011  |
|              |  |  | Soil                |  | 0,0038 mg/kg            | 0,00107  |
|              |  |  | Freshwater sediment |  | 0,0053 mg/kg            | 0,00126  |
|              |  |  | Marine sediment     |  | 0,496 µg/kg             | 0,000119 |
|              |  |  | Air                 |  | 0,179 µg/m <sup>3</sup> |          |

ERC8a: Wide dispersive indoor use of processing aids in open systems  
 ERC8d: Wide dispersive outdoor use of processing aids in open systems  
 ERC9a: Wide dispersive indoor use of substances in closed systems  
 ERC9b: Wide dispersive outdoor use of substances in closed systems

#### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

#### 1. Short title of Exposure Scenario: **Lubricants - Consumer**

|                                |   |
|--------------------------------|---|
| Main User Groups               | : <b>SU 21:</b> Consumer uses: Private households (= general public = consumers)  |
| Sector of use                  | : <b>SU 21:</b> Consumer uses: Private households (= general public = consumers)  |
| Product category               | : <b>PC1:</b> Adhesives, sealants<br><b>PC24:</b> Lubricants, greases, release products<br><b>PC31:</b> Polishes and wax blends   |
| Environmental release category | : <b>ERC8a, ERC8d, ERC9a, ERC9b:</b> Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems |
| Further information            | : Covers the consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment maintenance and disposal of waste oil.   |

**ERC8a, ERC8d,**

**ERC9a, ERC9b: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems**

#### Product characteristics

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

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(Msafe) : 0,804 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d  
 Dilution Factor (River) : 10  
 Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 365  
 Emission or Release Factor: Air : 60 %  
 Emission or Release Factor: Water : 5 %  
 Emission or Release Factor: Soil : 5 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)  
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)  
 Remarks : Prevent discharge of undissolved substance to or recover from wastewater.  
 Remarks : Do not apply industrial sludge to natural soils.  
 Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d  
 Effectiveness (of a measure) : 96,8 %  
 Procedures to limit air emissions from Sewage Treatment Plant :

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling consumer exposure for: PC1, PC24, PC31: Adhesives, sealants, Lubricants, greases, release products, Polishes and wax blends****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Other given operational conditions affecting consumers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Conditions and measures related to protection of consumer (e.g. behavioral advice, personal protection and hygiene)**

Consumer Measures : Do not ingest. If swallowed then seek immediate medical

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

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario      | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure       | Risk characterization ratio (PEC/PNEC): |
|----------------------------|----------------------------|---------------------|---------------------|------------|-------------------------|---|
| ERC8a, ERC8d, ERC9a, ERC9b | EUSES                      |                     | Freshwater          |            | 0,116 µg/L              | 0,00104                                 |
|                            |                            |                     | Marine water        |            | 0,0108 µg/L             | 0,000097                                |
|                            |                            |                     | Soil                |            | 0,0031 mg/kg            | 0,000882                                |
|                            |                            |                     | Freshwater sediment |            | 0,0047 mg/kg            | 0,00112                                 |
|                            |                            |                     | Marine sediment     |            | 0,435 µg/kg             | 0,000104                                |
|                            |                            |                     | Air                 |            | 0,147 µg/m <sup>3</sup> |   |

ERC8a: Wide dispersive indoor use of processing aids in open systems  
 ERC8d: Wide dispersive outdoor use of processing aids in open systems  
 ERC9a: Wide dispersive indoor use of substances in closed systems  
 ERC9b: Wide dispersive outdoor use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

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

**1. Short title of Exposure Scenario: Metal working fluids / rolling oils - Industrial**

Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use : **SU3:** Industrial Manufacturing (all)

Process category : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or formulation)  
**PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises  
 : **PROC 5:** Mixing or blending in batch processes for

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formulation of preparations and articles (multistage and/or significant contact)

**PROC7:** Industrial spraying

**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**PROC8b:** Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities

: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

**PROC10:** Roller application or brushing

**PROC13:** Treatment of articles by dipping and pouring

**PROC17:** Lubrication at high energy conditions and in partly open process

Environmental release category : **ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles

Further information : Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.

**ERC4: Industrial use****of processing aids in processes and products, not becoming part of articles****Product characteristics**

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

(Msafe) : 1.027,13 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d

Dilution Factor (River) : 10

Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300

Emission or Release Factor: Air : 2 %

Emission or Release Factor: Water : 0,003 %

Emission or Release Factor: Soil : 0 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 70 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

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Flow rate of sewage treatment plant effluent : 2.000 m3/d  
Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4,, PROC7, PROC8a, PROC8b,, PROC10, PROC13, PROC17: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact), Industrial spraying, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment  | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|--------------|------------|-------------------|---|
| ERC4                  | EUSES                      |                     | Freshwater   |            | 0,0843 µg/L       | 0,000759                                |
|                       |                            |                     | Marine water |            | 0,0076 µg/L       | 0,000069                                |
|                       |                            |                     | Soil         |            | 0,0018 mg/kg      | 0,000497                                |
|                       |                            |                     | Freshwater   |            | 0,0034 mg/kg      | 0,000811                                |

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|  |  |  |                 |  |              |          |
|--|--|--|-----------------|--|--------------|----------|
|  |  |  | sediment        |  |              |          |
|  |  |  | Marine sediment |  | 0,308 µg/kg  | 0,000074 |
|  |  |  | Air             |  | 0,0013 mg/m3 |          |

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario****1. Short title of Exposure Scenario: Metal working fluids / rolling oils – Professional**

- Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- Sector of use : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- Process category : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or formulation)  
**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
**PROC8b:** Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities  
: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
**PROC10:** Roller application or brushing  
**PROC11:** Non industrial spraying  
**PROC13:** Treatment of articles by dipping and pouring  
**PROC17:** Lubrication at high energy conditions and in partly open process
- Environmental release category : **ERC8a, ERC8d, ERC9a, ERC9b:** Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
- Further information : Covers the use in formulated MWFs including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils.

**ERC8a, ERC8d,**

**ERC9a, ERC9b: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems, Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems**

**Product characteristics**

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

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(Msafe) : 1,006 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d  
 Dilution Factor (River) : 10  
 Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300  
 Emission or Release Factor: Air : 60 %  
 Emission or Release Factor: Water : 5 %  
 Emission or Release Factor: Soil : 5 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 0 %)  
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)  
 Remarks : Prevent discharge of undissolved substance to or recover from wastewater.  
 Remarks : Do not apply industrial sludge to natural soils.  
 Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d  
 Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b,, PROC10, PROC11, PROC13, PROC17: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Lubrication at high energy conditions and in partly open process**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

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**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario      | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|----------------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC8a, ERC8d, ERC9a, ERC9b | EUSES                      |                     | Freshwater          |            | 0,175 µg/L        | 0,00158                                 |
|                            |                            |                     | Marine water        |            | 0,0168 µg/L       | 0,000151                                |
|                            |                            |                     | Soil                |            | 0,0058 mg/kg      | 0,00162                                 |
|                            |                            |                     | Freshwater sediment |            | 0,0071 mg/kg      | 0,00169                                 |
|                            |                            |                     | Marine sediment     |            | 0,0007 mg/kg      | 0,000161                                |
|                            |                            |                     | Air                 |            | 0,271 µg/m3       |   |

ERC8a: Wide dispersive indoor use of processing aids in open systems

ERC8d: Wide dispersive outdoor use of processing aids in open systems

ERC9a: Wide dispersive indoor use of substances in closed systems

ERC9b: Wide dispersive outdoor use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario****1. Short title of Exposure Scenario: Use as a fuel - industrial**

Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use : **SU3:** Industrial Manufacturing (all)

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

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Environmental release category : **ERC7: Industrial use of substances in closed systems**  
 Further information : Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

**ERC7: Industrial use****of substances in closed systems****Product characteristics**

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

(Msafe) : 1.484,848 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d

Dilution Factor (River) : 10

Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300

Emission or Release Factor: Air : 5 %

Emission or Release Factor: Water : 0,001 %

Emission or Release Factor: Soil : 0 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 95 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d

Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

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

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**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC7                  | EUSES                      |                     | Freshwater          |            | 0,0582 µg/L       | 0,000525                                |
|                       |                            |                     | Marine water        |            | 0,005 µg/L        | 0,000045                                |
|                       |                            |                     | Soil                |            | 0,0006 mg/kg      | 0,000168                                |
|                       |                            |                     | Freshwater sediment |            | 0,0023 mg/kg      | 0,000561                                |
|                       |                            |                     | Marine sediment     |            | 0,203 µg/kg       | 0,000049                                |
|                       |                            |                     | Air                 |            | 0,565 µg/m3       |   |

ERC7: Industrial use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario****1. Short title of Exposure Scenario: Use as a fuel – professional**

Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)  
 Sector of use : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)  
 Process category : **PROC1:** Use in closed process, no likelihood of exposure  
**PROC2:** Use in closed, continuous process with occasional controlled exposure  
**PROC3:** Use in closed batch process (synthesis or formulation)

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**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
**PROC8b:** Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities  
**PROC16:** Using material as fuel sources, limited exposure to unburned product to be expected

Environmental release category : **ERC9a, ERC9b:** Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

Further information : Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

**ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems**

**Product characteristics**

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

(Msafe) : 3,899 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m<sup>3</sup>/d  
Dilution Factor (River) : 10  
Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300  
Emission or Release Factor: Air : 1 %  
Emission or Release Factor: Water : 0,001 %  
Emission or Release Factor: Soil : 0,001 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m<sup>3</sup>/d  
Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

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

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC9a, ERC9b          | EUSES                      |                     | Freshwater          |            | 0,0452 µg/L       | 0,000408                                |
|                       |                            |                     | Marine water        |            | 0,0037 µg/L       | 0,000034                                |
|                       |                            |                     | Soil                |            | 0,0092 µg/kg      | 0,000003                                |
|                       |                            |                     | Freshwater sediment |            | 0,0018 mg/kg      | 0,000436                                |
|                       |                            |                     | Marine sediment     |            | 0,15 µg/kg        | 0,000036                                |
|                       |                            |                     | Air                 |            | 0,0045 µg/m3      |   |

ERC9a: Wide dispersive indoor use of substances in closed systems

ERC9b: Wide dispersive outdoor use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**

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**1. Short title of Exposure Scenario: Functional Fluids - Industrial**

|                                |  |
|--------------------------------|--|
| Main User Groups               | : <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites  |
| Sector of use                  | : <b>SU3:</b> Industrial Manufacturing (all)   |
| Process category               | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities<br>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| Environmental release category | : <b>ERC7:</b> Industrial use of substances in closed systems  |
| Further information            | : Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.  |

**ERC7: Industrial use****of substances in closed systems****Product characteristics**

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

(Msafe) : 1.027,13 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m<sup>3</sup>/d

Dilution Factor (River) : 10

Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300

Emission or Release Factor: Air : 1 %

Emission or Release Factor: Water : 0,003 %

Emission or Release Factor: Soil : 0,3 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

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Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d  
Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

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

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers percentage substance in the product up to 100 % (unless stated differently)  
Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC7                  | EUSES                      |                     | Freshwater          |            | 0,0843 µg/L       | 0,000759                                |
|                       |                            |                     | Marine water        |            | 0,0076 µg/L       | 0,000069                                |
|                       |                            |                     | Soil                |            | 0,0018 mg/kg      | 0,000503                                |
|                       |                            |                     | Freshwater sediment |            | 0,0034 mg/kg      | 0,000811                                |
|                       |                            |                     | Marine sediment     |            | 0,308 µg/kg       | 0,000074                                |

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Air

0,0023 mg/m3

ERC7: Industrial use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario****1. Short title of Exposure Scenario: Functional Fluids - Professional**

|                                |  |
|--------------------------------|--|
| Main User Groups               | : <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)   |
| Sector of use                  | : <b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)   |
| Process category               | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br>: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)<br><b>PROC20:</b> Heat and pressure transfer fluids in dispersive, professional use but closed systems |
| Environmental release category | : <b>ERC9a, ERC9b:</b> Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems   |
| Further information            | : Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.  |

**ERC9a, ERC9b: Wide**

**dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems**

**Product characteristics**

|   |  |
|---|--|
| Concentration of the Substance in Mixture/Article | : Covers percentage substance in the product up to 100 % (unless stated differently) |
| (Msafe)   | : 1,604 tonnes/day   |

**Environment factors not influenced by risk management**

|                                 |               |
|---------------------------------|---------------|
| Flow rate                       | : 18.000 m3/d |
| Dilution Factor (River)         | : 10          |
| Dilution Factor (Coastal Areas) | : 100         |

**Other given operational conditions affecting environmental exposure**

|                                  |       |
|----------------------------------|-------|
| Number of emission days per year | : 300 |
| Emission or Release Factor: Air  | : 5 % |

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Emission or Release Factor: Water : 2,5 %

Emission or Release Factor: Soil : 2,5 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 0 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%) (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d

Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a,, PROC20: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Heat and pressure transfer fluids in dispersive, professional use but closed systems**

**Product characteristics**

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

Remarks : Liquid, vapour pressure &gt; 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source**

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**Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC9a, ERC9b          | EUSES                      |                     | Freshwater          |            | 0,110 µg/L        | 0,000994                                |
|                       |                            |                     | Marine water        |            | 0,0102 µg/L       | 0,000092                                |
|                       |                            |                     | Soil                |            | 0,0029 mg/kg      | 0,000812                                |
|                       |                            |                     | Freshwater sediment |            | 0,0044 mg/kg      | 0,00106                                 |
|                       |                            |                     | Marine sediment     |            | 0,413 µg/kg       | 0,000099                                |
|                       |                            |                     | Air                 |            | 0,0226 µg/m3      |   |

ERC9a: Wide dispersive indoor use of substances in closed systems

ERC9b: Wide dispersive outdoor use of substances in closed systems

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario****1. Short title of Exposure Scenario: Use in polymer production – industrial**

|                                |   |
|--------------------------------|---|
| Main User Groups               | : <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites   |
| Sector of use                  | : <b>SU3, SU 10:</b> Industrial Manufacturing (all), Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)   |
| Process category               | : <b>PROC1:</b> Use in closed process, no likelihood of exposure<br><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure<br><b>PROC3:</b> Use in closed batch process (synthesis or formulation)<br><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises<br>: PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)<br><b>PROC6:</b> Calendering operations<br><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities<br><b>PROC14:</b> Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;<br><b>PROC15:</b> Use as laboratory reagent |
| Environmental release category | : <b>ERC4, ERC6c:</b> Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics  |
| Further information            | : 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).   |

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**ERC4, ERC6c:****Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics****Product characteristics**

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

(Msafe) : 171,467 tonnes/day

**Environment factors not influenced by risk management**

Flow rate : 18.000 m3/d

Dilution Factor (River) : 10

Dilution Factor (Coastal Areas) : 100

**Other given operational conditions affecting environmental exposure**

Number of emission days per year : 300

Emission or Release Factor: Air : 1 %

Emission or Release Factor: Water : 0,03 %

Emission or Release Factor: Soil : 0,01 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 80 %)

Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 96,8 %)

Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Remarks : Do not apply industrial sludge to natural soils.

Remarks : Sludge should be incinerated, contained or reclaimed.

**Conditions and measures related to municipal sewage treatment plant**

Flow rate of sewage treatment plant effluent : 2.000 m3/d

Effectiveness (of a measure) : 96,8 %

**Conditions and measures related to external treatment of waste for disposal**

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

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4,, PROC6, PROC8a, PROC8b, PROC14, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact), Calendering operations, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;, Use as laboratory reagent**

**Product characteristics**

Concentration of the Substance in : Covers percentage substance in the product up to 100 %

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Mixture/Article (unless stated differently)  
 Remarks : Liquid, vapour pressure > 10 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Organizational measures to prevent /limit releases, dispersion and exposure**

Do not ingest. If swallowed then seek immediate medical assistance., Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

**3. Exposure estimation and reference to its source****Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment         | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|-----------------------|----------------------------|---------------------|---------------------|------------|-------------------|---|
| ERC4, ERC6c           | EUSES                      |                     | Freshwater          |            | 0,0391 mg/L       | 0,352                                   |
|                       |                            |                     | Marine water        |            | 0,0039 mg/L       | 0,0352                                  |
|                       |                            |                     | Soil                |            | 1,72 mg/kg        | 0,486                                   |
|                       |                            |                     | Freshwater sediment |            | 1,58 mg/kg        | 0,376                                   |
|                       |                            |                     | Marine sediment     |            | 0,157 mg/kg       | 0,0376                                  |
|                       |                            |                     | Air                 |            | 0,0452 mg/m3      |   |

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

ERC6c: Industrial use of monomers for manufacture of thermoplastics

**4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario**