SAFETY DATA SHEET

AlphaPlus® 1-DODECENE

Version 4.11
Revision Date 2017-12-18

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

Product information
Product Name : AlphaPlus® 1-DODECENE
Material : 1087853, 1037008, 1015429, 1021778

EC-No. Registration number

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No. Index No.</th>
<th>Legal Entity</th>
<th>Registration number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Dodecene</td>
<td>112-41-4 203-968-4</td>
<td>Chevron Phillips Chemical Company LP</td>
<td>01-2119475509-26-0003</td>
</tr>
</tbody>
</table>

Relevant Identified Uses Supported

- Manufacture
- Distribution
- Formulation
- Use in Oil and Gas field drilling and production operations - Industrial
- Use in Oil and Gas field drilling and production operations – Professional
- Use in polymer production – industrial
- Use as an intermediate
- Use in coatings – industrial
- Use in coatings – professional
- Use in Coatings - Consumer
- Use as a cleaning agent – industrial
- Use as a cleaning agent – professional
- Use as a cleaning agent – consumer
- Lubricants - Industrial
- Lubricants - Professional
- Lubricants - Consumer
- Functional Fluids - Industrial
- Functional Fluids - Professional

Company
Chevron Phillips Chemical Company LP
Normal Alpha Olefins (NAO)
10001 Six Pines Drive
The Woodlands, TX 77380

Local
Chevron Phillips Chemicals International N.V.
Airport Plaza (Stockholm Building)
Leonardo Da Vinciiaan 19
1831 Diegem

SDS Number: 100000068203 1/56
SECTION 2: Hazards identification

Classification of the substance or mixture
REGULATION (EC) No 1272/2008

Aspiration hazard, Category 1

H304:
May be fatal if swallowed and enters airways.

Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal Word: Danger

Hazard Statements: H304
May be fatal if swallowed and enters airways.

Precautionary Statements

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P331 Do NOT induce vomiting.

Storage:
P405 Store locked up.

Disposal:
P501 Dispose of contents/container to an approved waste disposal plant.
Hazardous ingredients which must be listed on the label:
- 112-41-4 1-Dodecene

SECTION 3: Composition/information on ingredients

Synonyms:
- NAO 12
- Dodecene-1 (C12)
- C12H24

Molecular formula: C12H24

Mixtures

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No.</th>
<th>Classification (REGULATION (EC) No 1272/2008)</th>
<th>Concentration [wt%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Dodecene</td>
<td>112-41-4</td>
<td>Asp. Tox. 1; H304</td>
<td>95 - 100</td>
</tr>
<tr>
<td></td>
<td>203-968-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

SECTION 4: First aid measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

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. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point: 77 °C (171 °F)
Autoignition temperature: 225 °C (437 °F)
Suitable extinguishing media: Carbon dioxide (CO2).
## Unsuitable extinguishing media
- High volume water jet.

## Special protective equipment for fire-fighters
- Wear self-contained breathing apparatus for firefighting if necessary.

## Further information
- 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. Keep away from open flames, hot surfaces and sources of ignition.

### SECTION 6: Accidental release measures

<table>
<thead>
<tr>
<th>Personal precautions</th>
<th>Use personal protective equipment. Ensure adequate ventilation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental precautions</td>
<td>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.</td>
</tr>
<tr>
<td>Methods for cleaning up</td>
<td>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). Keep in suitable, closed containers for disposal.</td>
</tr>
</tbody>
</table>

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

### SECTION 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. Provide sufficient air exchange and/or exhaust in work rooms. 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. 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. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

### SECTION 8: Exposure controls/personal protection

#### Ingredients with workplace control parameters

SDS Number:100000068203

4/56
SE

<table>
<thead>
<tr>
<th>Beständsdelar</th>
<th>Grundval</th>
<th>Värde</th>
<th>Kontrollparametrar</th>
<th>Anmärkning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Dodecene</td>
<td>SE AFS</td>
<td>NGV</td>
<td>350 mg/m³</td>
<td>V, 19</td>
</tr>
<tr>
<td></td>
<td>SE AFS</td>
<td>KTV</td>
<td>500 mg/m³</td>
<td>V, 19</td>
</tr>
</tbody>
</table>

19 Gränsvärden avser kolväten i ångform dvs. upp till 12 kolatomer. Vid exponering för kolväten med mer än 12 kolatomer som förekommer i form av aerosol, partiklar eller vätskedroppar, tillämpas gränsvärdet för organiskt damm och dimma, 5 mg/m³. Gränsvärdet gäller inte för aromaafri lacknafta (< 2 viktsprocent) som har eget gränsvärde.

V Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas.

NO

Komponenter | Grundlag | Verdi | Kontrollparametrar | Nota |
-------------|----------|-------|--------------------|------|
1-Dodecene   | FOR-2011-12-06-1358 | TWA | 40 ppm, 275 mg/m³ |      |

LT

<table>
<thead>
<tr>
<th>Komponenttal</th>
<th>Pagrindas, bazé</th>
<th>Verte</th>
<th>Kontroles parametrai</th>
<th>Pastaba</th>
</tr>
</thead>
</table>
1-Dodecene    | LT OEL         | IPRD  | 350 mg/m³            |         |
|              | LT OEL         | TPRD  | 500 mg/m³            |         |

EE

Komponendid, osad | Alused | Väärtus | Kontrolliparameetrid | Märkused |
-------------------|--------|---------|----------------------|----------|
1-Dodecene         | EE OEL | Piirnorm | 5 mg/m³              | Aerosool |
|                   | EE OEL | Piirnorm | 350 mg/m³            | 11, Aur  |
|                   | EE OEL | Lühiajalise| kõrnuud piirnorm | 500 mg/m³ | 11, Aur |

11 Süsivesinike piirnormid on arvutatud auru faasile. Ule 12 süsinikuatomiga altalaatset süsivesinikel (tridekaanid ja kõrgemad) on 20 °C juures küllastussisaldus < 350 mg/m³. Aerosoolsete süsivesinike piirnorm on 5 mg/m³.

PNEC : Fresh water
Value: 0,001 mg/l

PNEC : Sea water
Value: 0,001 mg/l

PNEC : Fresh water sediment
Value: 9,87 mg/kg

PNEC : Sea sediment
Value: 9,87 mg/kg

PNEC : Soil
Value: 1,97 mg/kg

Engineering measures

Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators...
may not provide adequate protection.

**Hand protection**: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

**Eye protection**: Eye wash bottle with pure water. Tightly fitting safety goggles.

**Skin and body protection**: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame-resistant clothing. Footwear protecting against chemicals.

**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

### SECTION 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**: 77 °C (171 °F)
- **Lower explosion limit**: 0,6 %(V)
- **Upper explosion limit**: 5,4 %(V)
- **Oxidizing properties**: no
- **Autoignition temperature**: 225 °C (437 °F)
- **Thermal decomposition**: No data available
- **Molecular formula**: C12H24
- **Molecular weight**: 168,36 g/mol
- **pH**: Not applicable
- **Freezing point**: -35 °C (-31 °F)
- **Boiling point/boiling range**: 213 °C (415 °F)
- **Vapor pressure**: 19,30 Pa
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at 25 °C (77 °F)
0.35 kPa
at 65 °C (149 °F)

Relative density: 0.76
at 15.6 °C (60.1 °F)

Density: 0.76 g/m³
at 20 °C (68 °F)
762 kg/m³
at 15 °C (59 °F)
736 kg/m³
at 50 °C (122 °F)

Water solubility: Soluble in hydrocarbon solvents; insoluble in water.

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

Viscosity, kinematic: 0.68 cSt
at 100 °C (212 °F)

Relative vapor density: 5.81
(Air = 1.0)

Evaporation rate: No data available

SECTION 10: Stability and reactivity

Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid: Heat, flames and sparks.

Materials to avoid: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Thermal decomposition: No data available

Other data: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity

1-Dodecene: LD₅₀: > 10,000 mg/kg
Species: Rat
Sex: male
Method: Fixed Dose Method
Information given is based on data obtained from similar substances.

Skin irritation
1-Dodecene : No skin irritation

Eye irritation
1-Dodecene : No eye irritation
Information given is based on data obtained from similar substances.

Sensitization
1-Dodecene : Did not cause sensitization on laboratory animals.

Repeated dose toxicity
1-Dodecene : Species: Rat, Male and female
Sex: Male and female
Application Route: Oral diet
Dose: 0, 100, 500, 1000 mg/kg
Exposure time: 13 wk
Number of exposures: daily
NOEL: 1.000 mg/kg
Method: OECD Guideline 408
Information given is based on data obtained from similar substances.

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 300, 1000, 3000 ppm
Exposure time: 13 wk
Number of exposures: 6 hrs/d, 5 d/wk
NOEL: 3000 ppm
Method: OECD Guideline 413
Information given is based on data obtained from similar substances.

Reproductive toxicity
1-Dodecene : Species: Rat
Sex: male
Application Route: Oral diet
Dose: 0, 100, 500, or 1000 mg/kg
Exposure time: 44 D
Number of exposures: daily
Method: OECD Guideline 421
NOAEL Parent: 1.000 mg/kg
NOAEL F1: 1.000 mg/kg
Species: Rat  
Sex: female  
Application Route: Oral diet  
Dose: 0, 100, 500, or 1000 mg/kg  
Exposure time: 41-55 D  
Number of exposures: daily  
Method: OECD Guideline 421  
NOAEL Parent: 1.000 mg/kg  
NOAEL F1: 1.000 mg/kg  

Aspiration toxicity  
1-Dodecene : May be fatal if swallowed and enters airways.

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

Further information  
AlphaPlus® 1-DODECENE : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish  
1-Dodecene : No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates  
1-Dodecene : No toxicity at the limit of solubility.

Toxicity to algae  
1-Dodecene : No toxicity at the limit of solubility.

Biodegradability  
1-Dodecene : 74.1 - 80 %  
Testing period: 28 d  
Method: OECD Test Guideline 301  
This material is expected to be readily biodegradable.

Ecotoxicology Assessment  
Results of PBT assessment  
1-Dodecene : Non-classified PBT substance, Non-classified vPvB substance  

Additional ecological : No data available
SECTION 13: Disposal considerations

The information in this SDS 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 : Do not dispose of waste into sewer. 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

SECTION 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 SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN3295, HYDROCARBONS, LIQUID, N.O.S., (1-DODECENE), COMBUSTIBLE LIQUID, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (1-DODECENE), 9, III, (77 °C), MARINE POLLUTANT, (1-DODECENE)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (1-DODECENE), 9, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (1-DODECENE), 9, III

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (1-DODECENE), 9, III
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ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN9003, SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C AND NOT MORE THAN 100 °C, 9, ENVIRONMENTALLY HAZARDOUS, (1-DODECENE)

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

Other information : 1-Dodecene, S.T. 2, Cat. Y

SECTION 15: Regulatory information

National legislation
Chemical Safety Assessment
Ingredients : dodec-1-ene A Chemical Safety Assessment 203-968-4 has been carried out for this substance.
Major Accident Hazard : 96/82/EC Update: 2003
Legislation : Directive 96/82/EC does not apply
Water contaminating class (Germany) : WGK 1 slightly water endangering

Notification status
Europe REACH : On the inventory, or in compliance with the inventory
United States of America (USA) TSCA : On the inventory, or in compliance with the inventory
Canada DSL : On the inventory, or in compliance with the inventory
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 KECl : 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

SECTION 16: Other information

NFPA Classification : Health Hazard: 0
Fire Hazard: 2
Reactivity Hazard: 0
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Further information

Legacy SDS Number : PE0019

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

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

The information provided in this 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.

<table>
<thead>
<tr>
<th>Key or legend to abbreviations and acronyms used in the safety data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
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<td>AICS</td>
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<tr>
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<td>LC50</td>
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</table>

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

H304 May be fatal if swallowed and enters airways.
# Annex

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

### Main User Groups

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

### Sector of use

- **SU3, SU8, SU9**: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals

### 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
- **PROC8a**: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
- **PROC8b**: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
- **PROC15**: Use as laboratory reagent

### Environmental release category

- **ERC1, ERC4**: 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

## 2.1 Contributing scenario controlling environmental exposure for: **ERC1, ERC4**: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

(Msafe) : 213.67 tonnes/day

### Environment factors not influenced by risk management

- **Flow rate**: 18,000 m³/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**: 0.1 %
- **Emission or Release Factor: Water**: 0.001 %
- **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: 90 %)

Water: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of z (%):
(Effectiveness: 96.4 %)

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): 96.4 %

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
Remarks: Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartinent</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

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ERC1, ERC4 | EUSES | Freshwater | 0.280 µg/L | 0.311
Marine water | 0.105 µg/L | 0.117
Soil | 0.0048 mg/kg | 0.0027
Freshwater sediment | 0.669 mg/kg | 0.312
Marine sediment | 0.251 mg/kg | 0.117
Air | 0.0019 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 : 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
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15: Use as laboratory reagent

Environmental release category : 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
2.1 Contributing scenario controlling environmental exposure for: 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

(Msafe) : 1.708,07 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 : 0,01 %
Emission or Release Factor: Soil : 0,001 %
Remarks : Emission or Release Factor: Water : < 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: 96,4 %)
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) : 96,4 %

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
### Product characteristics
**Remarks**
- Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

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

#### Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.0289 µg/L</td>
<td>0.321</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0027 µg/L</td>
<td>0.0030</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.0184 mg/kg</td>
<td>0.0105</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.0691 mg/kg</td>
<td>0.0322</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.0065 mg/kg</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air</td>
<td>0.126 µg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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  
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: **Formulation**

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3, SU 10: Industrial Manufacturing (all), Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC14: Production of mixtures or articles by tabletting, compression, extrusion, pelletisation; Industrial setting;</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC2: Formulation of preparations</td>
</tr>
<tr>
<td>Further information</td>
<td>Formulation, packing and re-packaging of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.</td>
</tr>
</tbody>
</table>

2.1 Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations

(Msafe) : 74,906 tonnes/day

SDS Number: 100000068203
Environment factors not influenced by risk management

Flow rate : 18.000 m^3/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 : 0,5 %
Emission or Release Factor: Soil : 0,01 %
Remarks : Emission or Release Factor: Water : < 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: 96,4 %)
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^3/d
Effectiveness (of a measure) : 96,4 %

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 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), 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 tabletting, compression, extrusion, pelletization; Industrial setting;, Use as laboratory reagent

Product characteristics

Remarks : Liquid, vapour pressure < 0.5 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

SDS Number:100000068203 20/56
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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. No other specific measures identified. 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.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartments</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC2</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.177 µg/L</td>
<td>0.196</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0175 µg/L</td>
<td>0.0194</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>0.465 mg/kg</td>
<td>0.267</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.422 mg/kg</td>
<td>0.197</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.0418 mg/kg</td>
<td>0.0195</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air</td>
<td>0.0278 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC2: Formulation of preparations

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 in Oil and Gas field drilling and production operations - 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
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at

SDS Number:100000068203 21/56
### Environmental release category

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

### Further information

Further information: Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

### 2.1 Contributing scenario controlling environmental exposure for: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

#### Environment factors not influenced by risk management

| Flow rate       | 18.000 m3/d |

#### Technical conditions and measures / Organizational measures

Remarks: Prevent environmental discharge consistent with regulatory requirements.

#### 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

#### Product characteristics

Remarks: Liquid, vapour pressure < 0.5 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
Organizational measures to prevent /limit releases, dispersion and exposure
Do not ingest. If swallowed then seek immediate medical assistance. No other specific measures identified. 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.

3. Exposure estimation and reference to its source

Remarks: Not applicable

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

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

1. Short title of Exposure Scenario: Use in Oil and Gas field drilling and production operations – Professional

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC8d: Wide dispersive outdoor use of processing aids in open systems</td>
</tr>
</tbody>
</table>

2.1 Contributing scenario controlling environmental exposure for: ERC8d: Wide dispersive outdoor use of processing aids in open systems

Environment factors not influenced by risk management
Flow rate : 18.000 m³/d

Technical conditions and measures / Organizational measures
## Remarks:
Prevent environmental discharge consistent with regulatory requirements.

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

<table>
<thead>
<tr>
<th>Waste treatment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>External treatment and disposal of waste should comply with applicable local and/or national regulations.</td>
</tr>
</tbody>
</table>

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

### Product characteristics

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

### Amount used

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### Frequency and duration of use

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
</tbody>
</table>

### Other operational conditions affecting workers exposure

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.</td>
</tr>
</tbody>
</table>

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

Do not ingest. If swallowed then seek immediate medical assistance., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
</tr>
</tbody>
</table>

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

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

1. **Short title of Exposure Scenario:** Use in polymer production – industrial

<table>
<thead>
<tr>
<th>Main User Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sector of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU3, SU 10: Industrial Manufacturing (all), Formulation [mixing] of preparations and/or re-packaging (excluding</td>
</tr>
</tbody>
</table>
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**SAFETY DATA SHEET**

**Version 4.11**

**Revision Date 2017-12-18**

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

| Environmental release category | ERC4, ERC6c: 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). |

## 2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6c: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics

(Msafe) : 42,735 tonnes/day

<table>
<thead>
<tr>
<th>Environment factors not influenced by risk management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate : 18,000 m³/d</td>
</tr>
<tr>
<td>Dilution Factor (River) : 10</td>
</tr>
<tr>
<td>Dilution Factor (Coastal Areas) : 100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other given operational conditions affecting environmental exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of emission days per year : 300</td>
</tr>
<tr>
<td>Emission or Release Factor: Air : 1 %</td>
</tr>
<tr>
<td>Emission or Release Factor: Water : 0,001 %</td>
</tr>
<tr>
<td>Emission or Release Factor: Soil : 0,01 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical conditions and measures / Organizational measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air : Treat air emission to provide a typical removal efficiency of (%) : (Effectiveness: 80 %)</td>
</tr>
<tr>
<td>Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of z (%) : (Effectiveness: 96,4 %)</td>
</tr>
</tbody>
</table>

**SDS Number:** 100000068203
Remarks: Prevent discharge of undissolved substance to or recover from wastewater.

Conditions and measures related to municipal sewage treatment plant
Flow rate of sewage treatment plant effluent: 2.000 m³/d
Effectiveness (of a measure): 96.4 %

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 processes (synthesis) where opportunity for exposure arises, PROC5: 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 tabletting, compression, extrusion, pelletization; Industrial setting;, Use as laboratory reagent

Product characteristics
Remarks: Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC4, ERC6c</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.330 µg/L</td>
<td>0.366</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0328 µg/L</td>
<td>0.0364</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.815 mg/kg</td>
<td>0.468</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater</td>
<td>0.789 mg/kg</td>
<td>0.368</td>
<td></td>
</tr>
</tbody>
</table>

SDS Number: 100000068203  26/56
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: **SU 3**: Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use: **SU3, SU8, SU9**: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals

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
- **PROC8a**: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
- **PROC8b**: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
- **PROC15**: Use as laboratory reagent

Environmental release category: **ERC6a**: Industrial use resulting in manufacture of another substance (use of intermediates)

Further information: Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1 Contributing scenario controlling environmental exposure for: **ERC6a**: Industrial use resulting in manufacture of another substance (use of intermediates)
## Environment factors not influenced by risk management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate</td>
<td>18,000 m³/d</td>
</tr>
<tr>
<td>Dilution Factor (River)</td>
<td>10</td>
</tr>
<tr>
<td>Dilution Factor (Coastal Areas)</td>
<td>100</td>
</tr>
</tbody>
</table>

## Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of emission days per year</td>
<td>300</td>
</tr>
<tr>
<td>Emission or Release Factor: Air</td>
<td>0,01 %</td>
</tr>
<tr>
<td>Emission or Release Factor: Water</td>
<td>0,001 %</td>
</tr>
<tr>
<td>Emission or Release Factor: Soil</td>
<td>0,1 %</td>
</tr>
</tbody>
</table>

## 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: 96,4 %)

### Remarks
- Prevent discharge of undissolved substance to or recover from wastewater.
- Do not apply industrial sludge to natural soils.
- Sludge should be incinerated, contained or reclaimed.

## Conditions and measures related to municipal sewage treatment plant

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate of sewage treatment plant effluent</td>
<td>2,000 m³/d</td>
</tr>
<tr>
<td>Effectiveness (of a measure)</td>
<td>96,4 %</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste treatment</td>
<td>External treatment and disposal of waste should comply with applicable local and/or national regulations.</td>
</tr>
</tbody>
</table>

## 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

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
<td></td>
</tr>
</tbody>
</table>

## Amount used

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

## Frequency and duration of use

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
<td></td>
</tr>
</tbody>
</table>

## Other operational conditions affecting workers exposure

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above</td>
<td></td>
</tr>
</tbody>
</table>
Organizational measures to prevent /limit releases, dispersion and exposure
Do not ingest. If swallowed then seek immediate medical assistance. No other specific measures identified. 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.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Environment</th>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartments</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC6a</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.538 µg/L</td>
<td>0.597</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0536 µg/L</td>
<td>0.060</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>1.32 mg/kg</td>
<td>0.758</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>1.29 mg/kg</td>
<td>0.599</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.128 mg/kg</td>
<td>0.060</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air</td>
<td>0.185 µg/m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: **Use in coatings – 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 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

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

PROC14: Production of mixtures or articles by tabletting, compression, extrusion, pelleting; Industrial setting;

PROC15: Use as laboratory reagent

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

Further information: Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

(Msafe) : 11,905 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 : 98 %

Emission or Release Factor: Water : 0,002 %

Emission or Release Factor: Soil : 0 %

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 z (%): (Effectiveness: 96,4 %)

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) : 96,4 %

Conditions and measures related to external treatment of waste for disposal

SDS Number: 100000068203
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13, 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), 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, Roller application or brushing, Treatment of articles by dipping and pouring, Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting:, Use as laboratory reagent

Product characteristics
- Remarks: Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC4</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.0388 µg/L</td>
<td>0.043</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0369 µg/L</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.0928 mg/kg</td>
<td>0.043</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.0088 mg/kg</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.0804 mg/kg</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air</td>
<td>0.0149 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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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 in coatings – 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)
PROC4: 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)
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
PROC10: Roller application or brushing
PROC11: Non industrial spraying
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent
PROC19: Hand-mixing with intimate contact and only PPE available

Environmental release category : ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

Further information :

Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities.
SAFETY DATA SHEET

AlphaPlus® 1-DODECENE

Version 4.11

Revision Date 2017-12-18

of processing aids in open systems

(Msafe) : 0,025 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 : 98 %
Emission or Release Factor: Water : 1 %
Emission or Release Factor: Soil : 1 %

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: 96,4 %)
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) : 96,4 %

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, PROC15, PROC19: 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), 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, Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Use as laboratory reagent, Hand-mixing with intimate contact and only PPE available

Product characteristics

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks : Not applicable

Frequency and duration of use

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

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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. No other specific measures identified. 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.

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

#### Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.0388 µg/L</td>
<td>0.0431</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0037 µg/L</td>
<td>0.00410</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.0928 mg/kg</td>
<td>0.0433</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.0088 mg/kg</td>
<td>0.00411</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.0441 mg/kg</td>
<td>0.0254</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air</td>
<td>0.288 µg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open 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 in Coatings - Consumer

   - **Main User Groups:** SU 21: Consumer uses: Private households (= general public = consumers)
   - **Sector of use:** SU 21: Consumer uses: Private households (= general public = consumers)
   - **Product category:** PC1: Adhesives, sealants
   - PC4: Anti-Freeze and de-icing products
   - PC8: Biocidal products (e.g. Disinfectants, pest control)
   - PC9a: Coatings and paints, thinners, paint removers
   - PC9b: Fillers, putties, plasters, modelling clay

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PC9c: Finger paints  
PC15: Non-metal-surface treatment products  
PC18: Ink and toners  
PC23: Leather tanning, dye, finishing, impregnation and care products  
PC24: Lubricants, greases, release products  
PC31: Polishes and wax blends  
PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids

Environmental release category: ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

Further information: Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

Product characteristics

(Msafe) : 0,023 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 : 98,5 %  
Emission or Release Factor: Water : 1 %  
Emission or Release Factor: Soil : 0,5 %

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: 96,4 %)  
Remarks : Prevent discharge of undissolved substance to or recover from wastewater.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m³/d  
Effectiveness (of a measure) : 96,4 %  
Procedures to limit air emissions from Sewage Treatment Plant :

Conditions and measures related to external treatment of waste for disposal

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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, PC4, PC8, PC9a, PC9b, PC9c, PC15, PC18, PC23, PC24, PC31, PC34: Adhesives, sealants, Anti-Freeze and de-icing products, Biocidal products (e.g. Disinfectants, pest control), Coatings and paints, thinners, paint removers, Fillers, putties, plasters, modelling clay, Finger paints, Non-metal-surface treatment products, Ink and toners, Leather tanning, dye, finishing, impregnation and care products, Lubricants, greases, release products, Polishes and wax blends, Textile dyes, finishing and impregnating products; including bleaches and other processing aids

Product characteristics
Remarks: Liquid, vapour pressure < 0.5 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 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 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

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d</td>
<td>EUSES</td>
<td>Freshwater</td>
<td></td>
<td></td>
<td>0.0358 µg/L</td>
<td>0.0398</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td></td>
<td></td>
<td>0.0034 µg/L</td>
<td>0.00376</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td></td>
<td></td>
<td>0.0364 mg/kg</td>
<td>0.0209</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td></td>
<td></td>
<td>0.0856 mg/kg</td>
<td>0.0399</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td></td>
<td></td>
<td>0.0081 mg/kg</td>
<td>0.00378</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air</td>
<td></td>
<td></td>
<td>0.246 µg/m3</td>
<td></td>
</tr>
</tbody>
</table>

ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open systems

SDS Number:100000068203 36/56
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 a cleaning agent – industrial**

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3: Industrial Manufacturing (all)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC7: Industrial spraying</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC10: Roller application or brushing</td>
</tr>
<tr>
<td></td>
<td>PROC13: Treatment of articles by dipping and pouring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental release category</th>
<th>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</th>
</tr>
</thead>
</table>

Further information: Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

(Msafe) : 8,410 tonnes/day

Environment factors not influenced by risk management

| Flow rate | 18.000 m3/d |

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**Version 4.11**  
**Revision Date** 2017-12-18

#### Dilution Factor (River)  
10

#### Dilution Factor (Coastal Areas)  
100

### Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of emission days per year</td>
<td>300</td>
</tr>
<tr>
<td>Emission or Release Factor: Air</td>
<td>100 %</td>
</tr>
<tr>
<td>Emission or Release Factor: Soil</td>
<td>0 %</td>
</tr>
<tr>
<td>Remarks: Emission or Release Factor: Water</td>
<td>&lt; 0.001 %</td>
</tr>
</tbody>
</table>

### 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: 96.4 %)

**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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate of sewage treatment plant effluent</td>
<td>2.000 m³/d</td>
</tr>
<tr>
<td>Effectiveness (of a measure)</td>
<td>96.4 %</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste treatment</td>
<td>External treatment and disposal of waste should comply with applicable local and/or national regulations.</td>
</tr>
</tbody>
</table>

### 2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13

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, Roller application or brushing, Treatment of articles by dipping and pouring

### Product characteristics

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

### Amount used

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### Frequency and duration of use

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
</tbody>
</table>

### Other operational conditions affecting workers exposure

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.</td>
</tr>
</tbody>
</table>

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

- Do not ingest. If swallowed then seek immediate medical assistance., No other specific measures identified., 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 possible.
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.

3. Exposure estimation and reference to its source

### Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.022 µg/L</td>
<td>0.0244</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.002 µg/L</td>
<td>0.0022</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>0.114 mg/kg</td>
<td>0.0654</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.0525 mg/kg</td>
<td>0.0245</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.0048 mg/kg</td>
<td>0.0022</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air</td>
<td>0.0046 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC8a: Wide dispersive indoor use of processing aids in open systems  
ERC8d: Wide dispersive outdoor use of processing aids in open 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 a cleaning agent – 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:  
- PROC2: Use in closed, continuous process with occasional controlled exposure  
- PROC3: Use in closed batch process (synthesis or formulation)  
- PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises  
- PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
- PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  
- PROC10: Roller application or brushing  
- PROC11: Non industrial spraying  
- PROC13: Treatment of articles by dipping and pouring
### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

- **(Msafe)**: 0.045 tonnes/day

#### Environment factors not influenced by risk management

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate</td>
<td>18.000 m³/d</td>
</tr>
<tr>
<td>Dilution Factor (River)</td>
<td>10</td>
</tr>
<tr>
<td>Dilution Factor (Coastal Areas)</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of emission days per year</td>
<td>300</td>
</tr>
<tr>
<td>Emission or Release Factor: Air</td>
<td>2%</td>
</tr>
<tr>
<td>Emission or Release Factor: Soil</td>
<td>0%</td>
</tr>
<tr>
<td>Remarks</td>
<td>Emission or Release Factor: Water: &lt; 0.001%</td>
</tr>
</tbody>
</table>

#### 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: 96.4 %)
- **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)**: 96.4%

#### 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: PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13: 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 non-dedicated facilities
discharging) from/ to vessels/ large containers at dedicated facilities, Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.0219 µg/L</td>
<td>0.0243</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.002 µg/L</td>
<td>0.0022</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>0.105 µg/kg</td>
<td>0.00006</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.0523 mg/kg</td>
<td>0.0244</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.0048 mg/kg</td>
<td>0.0022</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air</td>
<td>0.0061 µg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open 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 a cleaning agent – consumer**

**Main User Groups**: SU 21: Consumer uses: Private households (= general public = consumers)

**Sector of use**: SU 21: Consumer uses: Private households (= general public = consumers)

**Product category**:  
- PC3: Air care products  
- PC4: Anti-Freeze and de-icing products  
- PC8: Biocidal products (e.g. Disinfectants, pest control)  
- PC9a: Coatings and paints, thinners, paint removers  
- PC9b: Fillers, putties, plasters, modelling clay  
- PC9c: Finger paints  
- PC24: Lubricants, greases, release products  
- PC35: Washing and cleaning products (including solvent based products)  
- PC38: Welding and soldering products (with flux coatings or flux cores.), flux products

**Environmental release category**: ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

**Further information**: Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

| **Product characteristics** |  
| --- | --- |  
| (Msafe) | 0,014 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**: 365  
- **Emission or Release Factor: Air**: 95 %  
- **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: 96,4 %)  
- **Remarks**: Prevent discharge of undissolved substance to or recover
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AlphaPlus® 1-DODECENE

Version 4.11

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) from Sewage Treatment Plant

: 96,4 %

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: PC3, PC4, PC8, PC9a, PC9b, PC9c, PC24, PC35, PC38: Air care products, Anti-Freeze and de-icing products, Biocidal products (e.g. Disinfectants, pest control), Coatings and paints, thinners, paint removers, Fillers, putties, plasters, modelling clay, Finger paints, Lubricants, greases, release products, Washing and cleaning products (including solvent based products), Welding and soldering products (with flux coatings or flux cores.), flux products

Product characteristics

Remarks

: Liquid, vapour pressure < 0.5 kPa at STP

Frequency and duration of use

Remarks

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

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 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

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.0567 µg/L</td>
<td>0.063</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SDS Number:100000068203

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# Safety Data Sheet

## AlphaPlus® 1-DODECENE

**Version 4.11**

**Revision Date 2017-12-18**

<table>
<thead>
<tr>
<th>Environment</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine water</td>
<td>0.0055 µg/L</td>
</tr>
<tr>
<td>Soil</td>
<td>0.0888 mg/kg</td>
</tr>
<tr>
<td>Freshwater sediment</td>
<td>0.196 mg/kg</td>
</tr>
<tr>
<td>Marine sediment</td>
<td>0.0131 mg/kg</td>
</tr>
<tr>
<td>Air</td>
<td>0.238 μg/m³</td>
</tr>
</tbody>
</table>

**ERC8a**: Wide dispersive indoor use of processing aids in open systems  
**ERC8d**: Wide dispersive outdoor use of processing aids in open 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](http://cefic.org/en/reach-for-industries-libraries.html)).

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

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC7: Industrial spraying</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC10: Roller application or brushing</td>
</tr>
<tr>
<td></td>
<td>PROC13: Treatment of articles by dipping and pouring</td>
</tr>
<tr>
<td></td>
<td>PROC17: Lubrication at high energy conditions and in partly open process</td>
</tr>
<tr>
<td></td>
<td>PROC18: Greasing at high energy conditions</td>
</tr>
</tbody>
</table>

| Environmental release category    | ERC4, ERC7: 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
2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of substances in closed systems

(Msafe) : 21,739 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 : 0,1 %
Emission or Release Factor: Soil : 0,1 %
Remarks : Emission or Release Factor: Water : < 0.001 %

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: 96,4 %)
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) : 96,4 %

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
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Product characteristics
Remarks: Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC4, ERC7</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.0227 µg/L</td>
<td>0.0253</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0021 µg/L</td>
<td>0.00231</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.0024 mg/kg</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.0544 mg/kg</td>
<td>0.0253</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.005 mg/kg</td>
<td>0.0023</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air</td>
<td>0.0456 µg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

SDS Number:100000068203  46/56
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:
- PROCI: Use in closed process, no likelihood of exposure
- PROC2: Use in closed, continuous process with occasional controlled exposure
- PROC3: Use in closed batch process (synthesis or formulation)
- PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
- PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
- PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
- 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
- PROC18: Greasing at high energy conditions
- PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems

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 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.

2.1 Contributing scenario controlling environmental exposure for: 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

(Msafe): 0.009 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

SDS Number: 100000068203
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| Emission or Release Factor: Air | 1.5 % |
| 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: 96.4 %)
- **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)**: 96.4 %

**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**

- **Remarks**: Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d, ERC9a, ERC9b</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.107 µg/L</td>
<td>0.118</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0105 µg/L</td>
<td>0.0116</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.217 mg/kg</td>
<td>0.124</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.255 mg/kg</td>
<td>0.119</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.025 mg/kg</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air</td>
<td>0.0046 µg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: SU 21: Consumer uses: Private households (= general public = consumers)
Sector of use: SU 21: Consumer uses: Private households (= general public = consumers)
Product category: PC1: Adhesives, sealants
PC24: Lubricants, greases, release products
PC31: Polishes and wax blends

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 consumer use of formulated lubricants in closed and open systems including transfer operations, application, operation of engines and similar articles, equipment
2.1 Contributing scenario controlling environmental exposure for: 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
(Msafe) : 0.009 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 : 1.5 %
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: 96.4 %)
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) : 96.4 %
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
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

Frequency and duration of use
SDS Number: 100000068203
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Remarks: Covers daily exposures up to 8 hours (unless stated differently)

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 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

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC8a, ERC8d, ERC9a, ERC9b</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.0915 µg/L</td>
<td>0.102</td>
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<td></td>
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<td>Marine water</td>
<td>0.0089 µg/L</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>0.178 mg/kg</td>
<td>0.102</td>
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</tr>
<tr>
<td></td>
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<td>Freshwater sediment</td>
<td>0.219 mg/kg</td>
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<tr>
<td></td>
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<td></td>
<td>Marine sediment</td>
<td>0.0214 mg/kg</td>
<td>0.0099</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air</td>
<td>0.0008 µg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: **Functional Fluids - 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
- 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

**Environmental release category**
- ERC7: 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.

2.1 Contributing scenario controlling environmental exposure for: ERC7: Industrial use of substances in closed systems

(Msafe) : 32,287 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: 0.1 %
- Emission or Release Factor: Soil: 0.1 %
- Remarks: Emission or Release Factor: Water: < 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: 96.4 %)
- **Remarks**
  - Prevent discharge of undissolved substance to or recover from wastewater.

**Conditions and measures related to municipal sewage treatment plant**
- Flow rate of sewage treatment: 2,000 m3/d

SDS Number: 100000068203  52/56
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
Remarks : Liquid, vapour pressure < 0.5 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., No other specific measures identified., 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.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartments</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC7</td>
<td>EUSES</td>
<td>Freshwater</td>
<td></td>
<td>0.0232 µg/L</td>
<td>0.0257</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td></td>
<td>0.0021 µg/L</td>
<td>0.00236</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td></td>
<td>0.0039 mg/kg</td>
<td>0.00226</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
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<td>0.0554 mg/kg</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td></td>
<td>0.0051 mg/kg</td>
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<tr>
<td></td>
<td></td>
<td>Air</td>
<td></td>
<td>0.230 µg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: **Functional Fluids - Professional**

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)</td>
</tr>
<tr>
<td>Process category</td>
<td>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 into small containers (dedicated filling line, including weighing) PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems</td>
</tr>
</tbody>
</table>

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.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems

(Msafe) : 0.018 tonnes/day

Environment factors not influenced by risk management

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>18,000 m3/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilution Factor (River)</td>
<td>10</td>
</tr>
<tr>
<td>Dilution Factor (Coastal Areas)</td>
<td>100</td>
</tr>
</tbody>
</table>

Other given operational conditions affecting environmental exposure

SDS Number: 1000000068203 54/56
### 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: 96.4 %)

**Remarks**
- Prevent discharge of undissolved substance to or recover from wastewater.
- Do not apply industrial sludge to natural soils.
- 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)**
- 96.4 %

### 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

**Remarks**
- Liquid, vapour pressure < 0.5 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.
- No other specific measures identified.
- 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.

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

- SDS Number:100000068203

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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).