SAFETY DATA SHEET
NESSOL Pentane 15

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

1.1. Product identifier

Product name
NESSOL Pentane 15

Chemical name
Hydrocarbons, C5, n-alkanes, isoalkanes

Product number
ID 10563

Internal Identification
135169

Synonyms; trade names
Previous product name: NESSOL LI 36.

EU REACH registration number
01-2119474207-37-0002

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

Identified uses
Manufacture of substance Distribution of substance Formulation & (re)packing of substances and mixtures Uses in coatings Use in cleaning agents Blowing agents Functional fluids Other Consumer Uses Use in laboratories

1.3. Details of the supplier of the safety data sheet

Supplier
Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1.4. Emergency telephone number

Emergency telephone
+61 2 9186 1132, Chemwatch: International Emergency Response Phone Number

National emergency telephone
+358 800 147 111, +358 9 471 977, Poison Information Centre

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (SI 2019 No. 720)

Physical hazards
Flam. Liq. 1 - H224

Health hazards
STOT SE 3 - H336 Asp. Tox. 1 - H304

Environmental hazards
Aquatic Chronic 2 - H411

2.2. Label elements

Hazard pictograms

Signal word
Danger
NESSOL Pentane 15

Hazard statements

H224 Extremely flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H336 May cause drowsiness or dizziness.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing vapour/ spray.
P273 Avoid release to the environment.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P331 Do NOT induce vomiting.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Supplemental label information

EUH066 Repeated exposure may cause skin dryness or cracking.

Contains

Hydrocarbons, C5, n-alkanes, isoalkanes

2.3. Other hazards

Highly volatile. Vapours may accumulate on the floor and in low-lying areas. Vapours may form explosive mixtures with air. Vapours may irritate throat/respiratory system. Risk of soil and ground water contamination.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

| Hydrocarbons, C5, n-alkanes, isoalkanes | 100 % |
| Classification | |
| Flam. Liq. 1 - H224 | |
| STOT SE 3 - H336 | |
| Asp. Tox. 1 - H304 | |
| Aquatic Chronic 2 - H411 | |

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Other information

Contains, n-pentane & isopentane ≥ 97 %., Benzene (CAS 71-43-2) < 0,1 %., n-hexane (CAS 110-54-3), < 1 %.

Identity outside the EU (CAS number and name of the substance):, 109-66-0, Pentane (isomeric mixture)., Previous EC number:, 203-692-4.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

Remove person to fresh air and keep comfortable for breathing. Get medical attention if symptoms are severe or persist.

Ingestion

Do not induce vomiting. Get medical attention immediately.

Skin contact

Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing.

Eye contact

Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed
NESSOL Pentane 15

General information
Vapours in high concentrations are narcotic. May cause nausea, headache, dizziness and intoxication. Gas or vapour in high concentrations may irritate the respiratory system. Irritating to skin. Repeated exposure may cause skin dryness or cracking. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

4.3. Indication of any immediate medical attention and special treatment needed
Notes for the doctor
Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture
Specific hazards
Extremely flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up. Severe explosion hazard when vapours are exposed to flames.

Hazardous combustion products
Carbon dioxide (CO2). Carbon monoxide (CO).

5.3. Advice for firefighters
Protective actions during firefighting
Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Special protective equipment for firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Personal precautions
Keep upwind to avoid inhalation of gases, vapours, fumes and smoke. Avoid inhalation of vapours and contact with skin and eyes. Wear adequate protective equipment at all operations.

For emergency responders
Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Use only in well-ventilated areas. Eliminate all sources of ignition. Take precautionary measures against static discharge.

6.2. Environmental precautions
Environmental precautions
Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up
Immediately start clean-up of the liquid and contaminated soil. Large spills should be collected mechanically (remove by pumping) for disposal. Small Spillages: Absorb spillage with sand or other inert absorbent. Do not use sawdust or other combustible material. Pay attention to the fire and health hazards caused by the product.

6.4. Reference to other sections
Reference to other sections
For personal protection, see Section 8.
NESSOL Pentane 15

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions
This material is a static accumulator. Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. Use only in well-ventilated areas. Try to avoid product volatilization during handling and transferring. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions
Flammable liquid storage. Store in accordance with local regulations. Keep container tightly closed, in a cool, well ventilated place. Keep away from food, drink and animal feeding stuffs. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Suitable container materials: Stainless steel. Carbon steel. Polystyrene

7.3. Specific end use(s)

Specific end use(s)
Not known.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Ingredient comments
Pentane: 500 ppm (8 h), 1500 mg/m3 (8 h), 630 ppm (15 min), 1900 mg/m3 (15 min)
HTP2020/F/IN

PNEC
Not available.

Hydrocarbons, C5, n-alkanes, isoalkanes

DNEL
Workers - Inhalation; Long term systemic effects: 3000 mg/m³
Workers - Dermal; Long term systemic effects: 432 mg/kg/day
Consumer - Inhalation; Long term systemic effects: 643 mg/m³
Consumer - Dermal; Long term systemic effects: 214 mg/kg/day
Consumer - Oral; Long term systemic effects: 214 mg/kg/day

8.2. Exposure controls

Appropriate engineering controls
Provide adequate ventilation. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice.

Eye/face protection
Spectacles.

Hand protection
Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber. The selected gloves should have a breakthrough time of at least 4 hours. Protection class 5. Protective gloves according to standard EN 374. Change protective gloves regularly.

Other skin and body protection
Protective clothing when needed. Wear anti-static protective clothing if there is a risk of ignition from static electricity.

Respiratory protection
Filter device/half mask Gas filter, type AX. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140.

Environmental exposure controls
Store in a demarcated bunded area to prevent release to drains and/or watercourses.
NESSOL Pentane 15

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance
Mobile liquid.

Colour
Clear.

Odour
Hydrocarbons. Mild.

Odour threshold
10 ppm (30 mg/m3) (pentane)

pH
-

Melting point
< -20°C (ASTM D 5950)

Initial boiling point and range
~ 20...45°C

Flash point
< -20°C (DIN 51755)

Upper/lower flammability or explosive limits
Lower flammable/explosive limit: 1,4 % Upper flammable/explosive limit: 7,8 %

Vapour pressure
45 - 79 kPa @ 20°C (calculated)
~ 110 kPa @ 38°C

Vapour density
2.5 (Air = 1.0)

Relative density
0.62 - 0.64 @ 15/4°C (ISO 12185)

Solubility(ies)
The product has poor water-solubility. (~ 40 mg/l @ 20 oC)

Partition coefficient
log Kow: 3 - 3.5

Auto-ignition temperature
250°C (ASTM E 659)

Decomposition Temperature
-

Viscosity
Kinematic viscosity < 2 mm2/s @ 40°C 0.3 - 0.6 mm2/s @ 20°C (ISO 3104)
Dynamic viscosity < 50 mPa s @ 20°C

Explosive properties
Not considered to be explosive.

Oxidising properties
Does not meet the criteria for classification as oxidising.

9.2. Other information

Other information
Not known.

Molecular weight
~ 72

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity
There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability
Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions
No potentially hazardous reactions known.

10.4. Conditions to avoid


NESSOL Pentane 15

Conditions to avoid
Keep away from heat, sparks and open flame. Take precautionary measures against static discharges.

10.5. Incompatible materials
Materials to avoid
Oxidising agents. Strong acids.

10.6. Hazardous decomposition products
Hazardous decomposition products
None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Toxicological effects
Based on available data the classification criteria are not met.

Skin corrosion/irritation
Skin corrosion/irritation
Based on available data the classification criteria are not met. (OECD 404) Repeated exposure may cause skin dryness or cracking.

Serious eye damage/irritation
Serious eye damage/irritation
Based on available data the classification criteria are not met. (OECD 405).

Skin sensitisation
Skin sensitisation
Based on available data the classification criteria are not met. (OECD 406).

Germ cell mutagenicity
Genotoxicity - in vitro
Based on available data the classification criteria are not met. (OECD 471, EU Method B10).

Genotoxicity - in vivo
Based on available data the classification criteria are not met. Based on available data the classification criteria are not met. (EU Method B12) (EU Method B12)

Carcinogenicity
Carcinogenicity
Based on available data the classification criteria are not met.

Reproductive toxicity
Reproductive toxicity - fertility
Based on available data the classification criteria are not met. (OECD 416)

Reproductive toxicity - development
Based on available data the classification criteria are not met. (OECD 414)

Specific target organ toxicity - single exposure
STOT - single exposure
May cause nausea, headache, dizziness and intoxication. Anaesthetic in high concentrations.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure
Based on available data the classification criteria are not met. (OECD 407, 413)

Aspiration hazard
Aspiration hazard
May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Toxicological information on ingredients.

Hydrocarbons, C5, n-alkanes, isoalkanes

Acute toxicity - oral
Notes (oral LD₅₀)
LD₅₀ > 2000 mg/kg, Oral, Rat (OECD 401, 423)

Acute toxicity - inhalation
Notes (inhalation LC₅₀)
LC₅₀ > 25,3 mg/l, Inhalation, Rat (OECD 403)
## SECTION 12: Ecological information

### 12.1. Toxicity

**Toxicity**

Based on available data the classification criteria are not met.

**Ecological information on ingredients.**

#### Hydrocarbons, C5, n-alkanes, isoalkanes

<table>
<thead>
<tr>
<th>Ecotoxicity Type</th>
<th>Endpoint</th>
<th>Value and Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute aquatic toxicity</td>
<td>LL₅₀, 96 hours: 30,5 mg/l, Fish (QSAR)</td>
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<tr>
<td>Acute toxicity - fish</td>
<td>EL₅₀, 48 hours: 53,2 mg/l, (QSAR)</td>
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<tr>
<td>Acute toxicity - aquatic invertebrates</td>
<td>EC₅₀, 48 hours: 2,3 mg/l, (OECD 202)</td>
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</tr>
<tr>
<td>Acute toxicity - aquatic plants</td>
<td>EL₅₀, 72 hours: 22,5 mg/l, Algae (QSAR)</td>
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<tr>
<td>Chronic aquatic toxicity</td>
<td>NOELR, 28 days: 6,8 mg/l, Fish (QSAR)</td>
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<tr>
<td>Chronic toxicity - aquatic invertebrates</td>
<td>NOELR, 21 days: 11,9 mg/l, (QSAR)</td>
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</tr>
</tbody>
</table>

### 12.2. Persistence and degradability

**Phototransformation**

The product contains volatile substances which may spread in the atmosphere. Can be photodegraded in the atmosphere.

**Stability (hydrolysis)**

No significant reaction in water.

**Ecological information on ingredients.**

#### Hydrocarbons, C5, n-alkanes, isoalkanes

<table>
<thead>
<tr>
<th>Ecotoxicity Type</th>
<th>Endpoint</th>
<th>Value and Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>Rapidly degradable (OECD 301F)</td>
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</tr>
</tbody>
</table>

### 12.3. Bioaccumulative potential

**Bioaccumulative potential**

The product is not bioaccumulating.

**Partition coefficient**

log Kow: 3 - 3,5

### 12.4. Mobility in soil

**Mobility**

Volatile. The product contains volatile substances which may spread in the atmosphere. Product does not adsorb onto organic material in soil or sediment.

**Henry's law constant**

KH = 1,3 atm m₃/mol (n-pentane); 1,4 atm m₃/mol (isopentane).

**Surface tension**

13 - 17 mN/m @ 25°C

### 12.5. Results of PBT and vPvB assessment

**Results of PBT and vPvB assessment**

This product does not contain any substances classified as PBT or vPvB.

### 12.6. Other adverse effects

7/62
NESSOL Pentane 15

Other adverse effects
Not known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information
Waste is classified as hazardous waste.

Disposal methods
Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Product residues retained in emptied containers can be hazardous. Waste packaging should be collected for reuse or recycling.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 1265

14.2. UN proper shipping name

Proper shipping name (ADR/RID) UN 1265 PENTANES, liquid

14.3. Transport hazard class(es)

ADR/RID class 3

14.4. Packing group

ADR/RID packing group I

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
MARINE POLLUTANT

14.6. Special precautions for user

Hazard Identification Number (ADR/RID) 33

Tunnel restriction code (D/E)

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

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Bulk (MARPOL 73/78, Annex II): Pentane (all isomers). Ship type: 3 Pollution category: Cat Y According to MARPOL: "Non-solidifying substance"

SECTION 15: Regulatory information

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

National regulations
EU regulatory references for the safety data sheet:

15.2. Chemical safety assessment
NESSOL Pentane 15

A chemical safety assessment has been carried out.

<table>
<thead>
<tr>
<th>SECTION 16: Other information</th>
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<tbody>
<tr>
<td><strong>Revision comments</strong></td>
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<td>NOTE: Lines within the margin indicate significant changes from the previous revision.</td>
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<td><strong>Revision date</strong></td>
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<tr>
<td><strong>Supersedes date</strong></td>
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<tr>
<td><strong>SDS number</strong></td>
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<tr>
<td><strong>Hazard statements in full</strong></td>
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</table>
Exposure scenario
Manufacture of Substance - Industrial

Identification

Product name Hydrocarbons, C5, n-alkanes, isoalkanes
EU REACH registration number 01-2119474207-37-0002

1. Title of exposure scenario

Main title Manufacture of Substance - Industrial
Process scope 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.
Main sector SU3 Industrial uses
Sector of use SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Environment

Environmental release category ERC1 Manufacture of the substance ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC ESVOC SPERC 1.1.v1

Worker

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

2. Conditions of use affecting exposure (industrial - Environment 1)

Amounts used

- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 9500 tonnes/year
- Fraction of Regional tonnage used locally: 1
- Annual site tonnage: 9500 tonnes
- Maximum daily site tonnage: 95 tonnes

Frequency and duration of use

- Continuous release.
- Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (initial release prior to RMM): 5.0E-02
Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 3.0E-03
Manufacture of Substance - Industrial

**Emission factor - soil**
Release fraction to soil from process (initial release prior to RMM): 1.0E-04

**Environmental factors not influenced by risk management measures**

**Dilution**
- Local freshwater dilution factor: 10
- Local marine water dilution factor: 100

**Risk management measures**

**Good practice**
Common practices vary across sites, thus conservative process release estimates used.

**STP type**
Municipal STP.

**STP details**
- Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
- Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
- Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 5.9E-05 kg/day
- Assumed domestic sewage treatment plant flow: 10 000 m³/day

**Technical onsite conditions and measures to reduce or limit discharges to air, water and soil**

**Air**
Treat air emission to provide a typical removal efficiency of 90%.

**Water**
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite waste water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 75.1. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

**Soil**
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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

**Waste treatment**
During manufacturing no waste of the substance is generated.

**Conditions and measures related to external recovery of waste**

**Recovery method**
During manufacturing no waste of the substance is generated.

**2. Conditions of use affecting exposure (Workers - Health 1)**

**Risk management measures**
Manufacture of Substance - Industrial

General exposures (closed systems)
No specific measures identified.
.
General exposures (open systems)
No specific measures identified.
.
Process sampling
No specific measures identified.
.
Laboratory activities
No specific measures identified.
.
Bulk transfers
(open systems)
No specific measures identified.
.
Bulk transfers
(closed systems)
No specific measures identified.
.
Equipment cleaning and maintenance
No specific measures identified.
.
Storage
No specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet.

3. Exposure estimation (Health 1)

Assessment method
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario  
**Distribution of Substance - Industrial**

<table>
<thead>
<tr>
<th>Identification</th>
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<tbody>
<tr>
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<tr>
<td>EU REACH registration number</td>
<td>01-2119474207-37-0002</td>
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</table>

1. **Title of exposure scenario**

<table>
<thead>
<tr>
<th>Main title</th>
<th>Distribution of Substance - Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process scope</td>
<td>Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.</td>
</tr>
<tr>
<td>Main sector</td>
<td>SU3 Industrial uses</td>
</tr>
</tbody>
</table>

2. **Conditions of use affecting exposure (Industrial - Environment 1)**

| Amounts used | 13/62 |

3. **Environment**

<table>
<thead>
<tr>
<th>Environmental release category</th>
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<tbody>
<tr>
<td>ERC1 Manufacture of the substance</td>
<td></td>
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<tr>
<td>ERC2 Formulation into mixture</td>
<td></td>
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<tr>
<td>ERC3 Formulation into solid matrix</td>
<td></td>
</tr>
<tr>
<td>ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)</td>
<td></td>
</tr>
<tr>
<td>ERC5 Use at industrial site leading to inclusion into/onto article</td>
<td></td>
</tr>
<tr>
<td>ERC6a Use of intermediate</td>
<td></td>
</tr>
<tr>
<td>ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)</td>
<td></td>
</tr>
<tr>
<td>ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)</td>
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</tr>
<tr>
<td>ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)</td>
<td></td>
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<tr>
<td>ERC7 Use of functional fluid at industrial site</td>
<td></td>
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</tbody>
</table>

| SPERC | ESVOC SPERC 1.1b.v1 |

4. **Worker**

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

2. **Conditions of use affecting exposure (Industrial - Environment 1)**

| Amounts used | 13/62 |
Distribution of Substance - Industrial

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 4000 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 8.0 tonnes
Maximum daily site tonnage: 400 kg

Frequency and duration of use
Continuous release.
Emission days: 20 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air
Release fraction to air from process (initial release prior to RMM): 1.0E-03

Emission factor - water
Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05

Emission factor - soil
Release fraction to soil from process (initial release prior to RMM): 1.0E-05

Environmental factors not influenced by risk management measures

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice
Common practices vary across sites, thus conservative process release estimates used.

STP type
Municipal STP.

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 15,000 tonne/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of 90%.

Water
Risk from environmental exposure is driven by fresh water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 0.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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.

Conditions and measures related to external recovery of waste

Recovery method
External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).
Distribution of Substance - Industrial

**Amounts used**

Not applicable.

**Frequency and duration of use**

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

**Other given operational conditions affecting workers exposure**

**Setting**
Assumes a good basic standard of occupational hygiene is implemented.

**Temperature**
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Risk management measures**

General exposures (closed systems)
No specific measures identified.

General exposures (open systems)
No specific measures identified.

Process sampling
No specific measures identified.

Laboratory activities
No specific measures identified.

Bulk transfers (closed systems)
No specific measures identified.

Bulk transfers (open systems)
No specific measures identified.

Drum and small package filling
No specific measures identified.

Equipment cleaning and maintenance
No specific measures identified.

Storage
No specific measures identified.

3. Exposure estimation (Environment 1)

**Assessment method**

Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)
Distribution of Substance - Industrial

**Assessment method**
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

**4. Guidance to check compliance with the exposure scenario (Health 1)**

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
# Exposure scenario

Formulation & (Re)packing of Substances and Mixtures - Industrial

<table>
<thead>
<tr>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product name</strong></td>
</tr>
<tr>
<td><strong>EU REACH registration number</strong></td>
</tr>
</tbody>
</table>

## 1. Title of exposure scenario

- **Main title**: Formulation & (Re)packing of Substances and Mixtures - Industrial
- **Process scope**: Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
- **Main sector**: SU3 Industrial uses
- **Sector of use**: SU10 Formulation [mixing] of preparations and/or re-packaging

## Environment

- **Environmental release category**: ERC2 Formulation into mixture
- **SPERC**: ESVOC SPERC 2.2.v1

## Worker

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

## 2. Conditions of use affecting exposure (Industrial - Environment 1)

### Amounts used

- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 10,000 tonnes/year
- Fraction of Regional tonnage used locally: 1
- Annual site tonnage: 1000 tonnes
- Maximum daily site tonnage: 10 tonnes

### Frequency and duration of use

- Continuous release.
- Emission days: 100 days/year
Formulation & (Re)packing of Substances and Mixtures - Industrial

Other given operational conditions affecting environmental exposure

Emission factor - air
Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): 2.5E-02

Emission factor - water
Release fraction to wastewater from process (initial release prior to RMM): 2.0E-03

Emission factor - soil
Release fraction to soil from process (initial release prior to RMM): 1.0E-04

Environmental factors not influenced by risk management measures

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice
Common practices vary across sites, thus conservative process release estimates used.

STP type
Municipal STP.

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 180 tonne/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of 0%.

Water
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite waste water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 29.4. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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.

Conditions and measures related to external recovery of waste

Recovery method
External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used
Not applicable.

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure
Formulation & (Re)packing of Substances and Mixtures - Industrial

**Setting**  
Assumes a good basic standard of occupational hygiene is implemented.

**Temperature**  
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Risk management measures**

- General exposures (closed systems)
  - No specific measures identified.
- General exposures (open systems)
  - No specific measures identified.
- Batch processes at elevated temperatures
  - Operation is carried out at elevated temperature (> 20°C above ambient temperature).
  - No specific measures identified.
- Process sampling
  - No specific measures identified.
- Laboratory activities
  - No specific measures identified.
- Bulk transfers
  - No specific measures identified.
- Mixing operations (open systems)
  - No specific measures identified.
- Manual
  - Transfer from/pouring from containers
  - No specific measures identified.
- Drum/batch transfers
  - No specific measures identified.

3. Exposure estimation (Environment 1)

**Assessment method**  
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

**Assessment method**  
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)
Formulation & (Re)packing of Substances and Mixtures - Industrial

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
# Exposure scenario

## Uses in Coatings - Industrial

<table>
<thead>
<tr>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product name</strong></td>
</tr>
<tr>
<td><strong>EU REACH registration number</strong></td>
</tr>
</tbody>
</table>

## 1. Title of exposure scenario

<table>
<thead>
<tr>
<th><strong>Main title</strong></th>
<th>Uses in Coatings - Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process scope</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Main sector</strong></td>
<td>SU3 Industrial uses</td>
</tr>
</tbody>
</table>

## Environment

| **Environmental release category** | ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article) |
| **SPERC** | ESVOC SPERC 4.3a.v1 |

## Worker

<table>
<thead>
<tr>
<th><strong>Process category</strong></th>
<th>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</td>
</tr>
<tr>
<td></td>
<td>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</td>
</tr>
<tr>
<td></td>
<td>PROC4 Chemical production where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC5 Mixing or blending in batch processes</td>
</tr>
<tr>
<td></td>
<td>PROC7 Industrial spraying</td>
</tr>
<tr>
<td></td>
<td>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b Transfer of substance or mixture (charging and discharging) 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>PROC15 Use as laboratory reagent.</td>
</tr>
</tbody>
</table>

## 2. Conditions of use affecting exposure (Industrial - Environment 1)

### Amounts used

| **Fraction of EU tonnage used in region:** | 0.1 |
| **Regional use tonnage:** | 250 tonnes/year |
| **Fraction of Regional tonnage used locally:** | 1 |
| **Annual site tonnage:** | 250 tonnes |
| **Maximum daily site tonnage:** | 13 tonnes |

### Frequency and duration of use

| **Continuous release.** |
| **Emission days:** | 20 days/year |

### Other given operational conditions affecting environmental exposure
 Uses in Coatings - Industrial

**Emission factor - air**  Release fraction to air from process (initial release prior to RMM): 0.98

**Emission factor - water**  Release fraction to wastewater from process (initial release prior to RMM): 7.0E-03

**Emission factor - soil**  Release fraction to soil from process (initial release prior to RMM): 0

**Environmental factors not influenced by risk management measures**

**Dilution**  Local freshwater dilution factor: 10
Local marine water dilution factor: 100

**Risk management measures**

**Good practice**  Common practices vary across sites, thus conservative process release estimates used.

**STP type**  Municipal STP.

**STP details**  Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 21 tonne/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

**Technical onsite conditions and measures to reduce or limit discharges to air, water and soil**

**Air**  Treat air emission to provide a typical removal efficiency of 90%.

**Water**  Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite waste water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 84.1. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

**Soil**  Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

**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.

**Conditions and measures related to external recovery of waste**

**Recovery method**  External recovery and recycling of waste should comply with applicable local and/or national regulations.

---

**2. Conditions of use affecting exposure (Workers - Health 1)**

**Product characteristics**

**Physical state**  Liquid

**Concentration details**  Covers percentage substance in the product up to 100% (unless stated differently).

**Amounts used**  Not applicable.

**Frequency and duration of use**  Covers daily exposures up to 8 hours (unless stated differently).

**Other given operational conditions affecting workers exposure**

**Setting**  Assumes a good basic standard of occupational hygiene is implemented.

**Temperature**  Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Uses in Coatings - Industrial

Risk management measures

- General exposures (closed systems)
  No specific measures identified.
- General exposures (closed systems)
  With sample collection
  Use in contained systems
  No specific measures identified.
- Film formation - force drying (50 - 100°C), stoving (> 100°C), UV/EB radiation curing
  Continuous process
  No specific measures identified.
- Mixing operations
  (closed systems)
  General exposures (closed systems)
  No specific measures identified.
- Film formation - air drying
  No specific measures identified.
- Preparation of material for application
  Mixing operations
  (open systems)
  No specific measures identified.
- Spraying (automatic/robotic)
  Carry out in a vented booth provided with laminar airflow.
- Manual spraying
  Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
  Wear a respirator conforming to EN140 with Type A filter or better.
- Material transfers
  No specific measures identified.
- Roller, spreader, flow application
  No specific measures identified.
- Dipping, immersion and pouring
  No specific measures identified.
- Laboratory activities
  No specific measures identified.
- Material transfers
  Drum/batch transfers
  Transfer from/pouring from containers
  No specific measures identified.
- Production of preparations or articles by tabletting, compression, extrusion, pelletisation
  No specific measures identified.

3. Exposure estimation (Environment 1)
Uses in Coatings - Industrial

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
## Exposure scenario

**Uses in Coatings - Consumer**

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<thead>
<tr>
<th>Identification</th>
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<tbody>
<tr>
<td><strong>Product name</strong></td>
</tr>
<tr>
<td><strong>EU REACH registration number</strong></td>
</tr>
</tbody>
</table>

### 1. Title of exposure scenario

- **Main title**: Uses in Coatings - Consumer
- **Process scope**: 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.
- **Product category**:
  - PC1 Adhesives, sealants.
  - PC4 Anti-freeze and de-icing products.
  - PC8 Biocidal products
  - PC9a Coatings and paints, thinners, paint removers.
  - PC9b Fillers, putties, plasters, modelling clay.
  - PC9c Finger paints.
  - PC15 Non-metal-surface treatment products.
  - PC18 Ink and toners.
  - PC23 Leather treatment products
  - PC24 Lubricants, greases and release products.
  - PC31 Polishes and wax blends.
  - PC34 Textile dyes and impregnating products
- **Main sector**: SU21 Consumer uses

### Environment

- **Environmental release category**:
  - ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
  - ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
- **SPERC**: ESVOC SPERC 8.3c.v1
- **Non-Industrial**
Uses in Coatings - Consumer

Product sub-category
- PC1_1 Glues, hobby use
- PC1_2 Glues DIY-use (carpet glue, tile glue, wood parquet glue)
- PC1_3 Glue from spray
- PC1_4 Sealants
- PC4_1 Washing car window
- PC4_2 Pouring into radiator
- PC4_3 Lock de-icer
- PC8_1 Laundry and dish-washing products
- PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
- PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
- PC9a_1 Water-borne latex wall paint
- PC9a_2 Solvent-rich, high-solid, water-borne paint
- PC9a_3 Aerosol spray can
- PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
- PC9b_1 Fillers and putty
- PC9b_2 Plasters and floor equalisers
- PC9b_3 Modelling clay
- PC15_1 Water-borne latex wall paint
- PC15_2 Solvent rich, high solid, water-borne paint
- PC15_3 Aerosol spray can
- PC15_4 Removers (paint-, glue-, wall paper-, sealant remover)
- PC23_1 Polishes, wax/cream (floor, furniture, shoes)
- PC23_2 Polishes, spray (furniture, shoes)
- PC24_1 Liquids
- PC24_2 Pastes
- PC24_3 Sprays
- PC31_1 Polishes, wax/cream (floor, furniture, shoes)
- PC31_2 Polishes, spray (furniture, shoes)

2. Conditions of use affecting exposure (Non-Industrial - Environment 1)

Amounts used
- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 50 tonnes/year
- Fraction of Regional tonnage used locally: 5.0E-04
- Annual site tonnage: 2.5E-02 tonnes
- Maximum daily site tonnage: 6.8E-02 kg/day

Frequency and duration of use
- Continuous release.
- Emission days: 365 days/year

Other given operational conditions affecting environmental exposure
- Emission factor - air: Release fraction to air from process (initial release prior to RMM): 0.985
- Emission factor - water: Release fraction to wastewater from process (initial release prior to RMM): 0.01
- Emission factor - soil: Release fraction to soil from process (initial release prior to RMM): 0.005

Environmental factors not influenced by risk management measures
- Dilution: Local freshwater dilution factor: 10
- Local marine water dilution factor: 100

Risk management measures
- STP type: Municipal STP.
# Uses in Coatings - Consumer

## STP details

- Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
- Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 3.7 tonne/day
- Assumed domestic sewage treatment plant flow: 2000 m³/day

## 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.

## Conditions and measures related to external recovery of waste

### Recovery method

External recovery and recycling of waste should comply with applicable local and/or national regulations.

## 2. Conditions of use affecting exposure (Non-Industrial - Health 1)

### Product characteristics

**Physical state**

- Liquid

**Concentration details**

- PC1_1 Glues, hobby use
- PC1_2 Glues DIY-use (carpet glue, tile glue, wood parquet glue)
- PC1_3 Glue from spray
- PC1_4 Sealants: Covers concentrations up to 30%
- PC4_1 Washing car window
- PC9b_3 Modelling clay: Covers concentrations up to 1%
- PC4_2 Pouring into radiator
- PC18 Ink and toners
- PC34 Textile dyes and impregnating products: Covers concentrations up to 10%
- PC4_3 Lock de-icer
- PC9a_3 Aerosol spray can
- PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
- PC23_1 Polishes, wax/cream (floor, furniture, shoes)
- PC23_2 Polishes, spray (furniture, shoes)
- PC24_3 Sprays
- PC31_1 Polishes, wax/cream (floor, furniture, shoes)
- PC31_2 Polishes, spray (furniture, shoes): Covers concentrations up to 50%
- PC8_1 Laundry and dish-washing products
- PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners): Covers concentrations up to 5%
- PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners): Covers concentrations up to 15%
- PC9a_1 Water-borne latex wall paint
- PC15_1 Water-borne latex wall paint: Covers concentrations up to 1.5%
- PC9a_2 Solvent-rich, high-solid, water-borne paint
- PC15_2 Solvent rich, high solid, water-borne paint: Covers concentrations up to 27.5%
- PC9b_1 Fillers and putty
- PC9b_2 Plasters and floor equalisers: Covers concentrations up to 2%
- PC9c Finger paints: Covers concentrations up to 50%. Avoid using at a product concentration greater than 5%
- PC24_1 Liquids: Covers concentrations up to 100%
- PC24_2 Pastes: Concentration of substance in product: 20%

## Amounts used
Uses in Coatings - Consumer

PC1_1 Glues, hobby use
For each use event, covers use amounts up to 9 g.

PC1_2 Glues DIY-use (carpet glue, tile glue, wood parquet glue)
For each use event, covers use amounts up to 6390 g.

PC1_3 Glue from spray
For each use event, covers use amounts up to 85.05 g.

PC1_4 Sealants
For each use event, covers use amounts up to 75 g.

PC4_1 Washing car window
For each use event, covers use amounts up to 0.5 g.

PC4_2 Pouring into radiator
For each use event, covers use amounts up to 2000 g.

PC4_3 Lock de-icer
For each use event, covers use amounts up to 4 g.

PC8_1 Laundry and dish-washing products
For each use event, covers use amounts up to 15 g.

PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
For each use event, covers use amounts up to 27 g.

PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
For each use event, covers use amounts up to 35 g.

PC9a_1 Water-borne latex wall paint
For each use event, covers use amounts up to 2760 g.

PC9a_2 Solvent-rich, high-solid, water-borne paint
For each use event, covers use amounts up to 744 g.

PC9a_3 Aerosol spray can
For each use event, covers use amounts up to 215 g.

PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
For each use event, covers use amounts up to 491 g.

PC9b_1 Fillers and putty
For each use event, covers use amounts up to 85 g.

PC9b_2 Plasters and floor equalisers
For each use event, covers use amounts up to 13.8 kg.

PC15_1 Water-borne latex wall paint
For each use event, covers use amounts up to 2760 g.

PC15_2 Solvent rich, high solid, water-borne paint
For each use event, covers use amounts up to 744 g.
Uses in Coatings - Consumer

PC15_3 Aerosol spray can
For each use event, covers use amounts up to 215 g.

PC15_4 Removers (paint-, glue-, wall paper-, sealant remover)
For each use event, covers use amounts up to 491 g.

PC18 Ink and toners.
For each use event, covers use amounts up to 40 g.

PC23_1 Polishes, wax/cream (floor, furniture, shoes)
For each use event, covers use amounts up to 56 g.

PC23_2 Polishes, spray (furniture, shoes)
For each use event, covers use amounts up to 56 g.

PC24_1 Liquids
For each use event, covers use amounts up to 2200 g.

PC24_2 Pastes
For each use event, covers use amounts up to 34 g.

PC24_3 Sprays
For each use event, covers use amounts up to 73 g.

PC31_1 Polishes, wax/cream (floor, furniture, shoes)
For each use event, covers use amounts up to 142 g.

PC31_2 Polishes, spray (furniture, shoes)
For each use event, covers use amounts up to 35 g.

PC34 Textile dyes and impregnating products
For each use event, covers use amounts up to 115 g.

Frequency and duration of use
Uses in Coatings - Consumer

PC1_1 Glues, hobby use
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 4.00 hours per event.

PC1_2 Glues DIY-use (carpet glue, tile glue, wood parquet glue)
Covers use up to 1 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 6.00 hours per event.

PC1_3 Glue from spray
Covers use up to 6 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 4.00 hours per event.

PC1_4 Sealants
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 1.00 hour per event.

PC4_1 Washing car window
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.02 hours per event.

PC4_2 Pouring into radiator
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.17 hours per event.

PC4_3 Lock de-icer
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.25 hours per event.

PC8_1 Laundry and dish-washing products
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.50 hours per event.

PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
Covers use up to 128 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.33 hours per event.

PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
Covers use up to 128 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.17 hours per event.

PC9a_1 Water-borne latex wall paint
Covers use up to 4 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 2.20 hours per event.
Uses in Coatings - Consumer

- PC9a_2 Solvent-rich, high-solid, water-borne paint
  Covers use up to 6 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.20 hours per event.

- PC9a_3 Aerosol spray can
  Covers use up to 2 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 0.33 hours per event.

- PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
  Covers use up to 3 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.00 hours per event.

- PC9b_1 Fillers and putty
  Covers use up to 12 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 4.00 hour per event.

- PC9b_2 Plasters and floor equalisers
  Covers use up to 12 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.00 hours per event.

- PC9b_3 Modelling clay
  Covers use up to 365 days/year.
  Covers use up to 1 time(s)/day.

- PC9c Finger paints
  Covers use up to 365 days/year.
  Covers use up to 1 time(s)/day.

- PC15_1 Water-borne latex wall paint
  Covers use up to 4 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.20 hours per event.

- PC15_2 Solvent rich, high solid, water-borne paint
  Covers use up to 6 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.20 hours per event.

- PC15_3 Aerosol spray can
  Covers use up to 2 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 0.33 hours per event.

- PC15_4 Removers (paint-, glue-, wall paper-, sealant remover)
  Covers use up to 3 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.00 hours per event.

- PC18 Ink and toners.
Uses in Coatings - Consumer

Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 2.20 hours per event.

PC23_1 Polishes, wax/cream (floor, furniture, shoes)
Covers use up to 29 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 1.23 hours per event.

PC23_2 Polishes, spray (furniture, shoes)
Covers use up to 8 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.33 hours per event.

PC24_1 Liquids
Covers use up to 4 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.17 hours per event.

PC24_2 Pastes
Covers use up to 10 days/year.
Covers use up to 1 time(s)/day.

PC24_3 Sprays
Covers use up to 6 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.17 hours per event.

PC31_1 Polishes, wax/cream (floor, furniture, shoes)
Covers use up to 29 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 1.23 hours per event.

PC31_2 Polishes, spray (furniture, shoes)
Covers use up to 8 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.33 hours per event.

PC34 Textile dyes and impregnating products
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 1.00 hour per event.

Human factors not influenced by risk management
Uses in Coatings - Consumer

Potentially exposed body parts

PC1_1 Glues, hobby use . PC1_3 Glue from spray . PC1_4 Sealants . PC9b_1 Fillers and putty : Covers skin contact area up to 35.73 cm². PC1_2 Glues DIY-use (carpet glue, tile glue, wood parquet glue) : Covers skin contact area up to 110.00 cm². PC4_2 Pouring into radiator . PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) : Covers skin contact area up to 428.00 cm². PC4_3 Lock de-icer : Covers skin contact area up to 214.40 cm². PC8_1 Laundry and dish-washing products . PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) . PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover) . PC9b_2 Plasters and floor equalisers . PC15_4 Removers (paint-, glue-, wall paper-, sealant remover) . PC34 Textile dyes and impregnating products : Covers skin contact area up to 857.50 cm². PC9a_1 Water-borne latex wall paint . PC9a_2 Solvent-rich, high-solid, water-borne paint . PC15_1 Water-borne latex wall paint . PC15_2 Solvent rich, high solid, water-borne paint . PC24_3 Sprays : Covers skin contact area up to 428.75 cm². PC9b_3 Modelling clay . PC9c Finger paints : Covers skin contact area up to 254.40 cm². PC18 Ink and toners. : Covers skin contact area up to 71.40 cm². PC23_1 Polishes, wax/cream (floor, furniture, shoes) . PC23_2 Polishes, spray (furniture, shoes) . PC31_1 Polishes, wax/cream (floor, furniture, shoes) . PC31_2 Polishes, spray (furniture, shoes) : Covers skin contact area up to 430.00 cm². PC24_1 Liquids . PC24_2 Pastes : Covers skin contact area up to 468.00 cm². PC9b_3 Modelling clay : For each use event, assumes swallowed amount of (g): 1 g . PC9c Finger paints : For each use event, assumes swallowed amount of (g): 1.35 g .

Other given operational conditions affecting Non-industrial exposure

Temperature
Assumes activities are at ambient temperature (unless stated differently).

Room size
PC1_1 Glues, hobby use . PC1_2 Glues DIY-use (carpet glue, tile glue, wood parquet glue) . PC1_3 Glue from spray . PC1_4 Sealants . PC8_1 Laundry and dish-washing products . PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) . PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) . PC9a_1 Water-borne latex wall paint . PC9a_2 Solvent-rich, high-solid, water-borne paint . PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover) . PC9b_1 Fillers and putty . PC9b_2 Plasters and floor equalisers . PC15_1 Water-borne latex wall paint . PC15_2 Solvent rich, high solid, water-borne paint . PC15_4 Removers (paint-, glue-, wall paper-, sealant remover) . PC18 Ink and toners . PC23_1 Polishes, wax/cream (floor, furniture, shoes) . PC23_2 Polishes, spray (furniture, shoes) . PC31_1 Polishes, wax/cream (floor, furniture, shoes) . PC31_2 Polishes, spray (furniture, shoes) . PC34 Textile dyes and impregnating products : Covers use in room size of 20 m³. PC4_1 Washing car window . PC4_2 Pouring into radiator . PC4_3 Lock de-icer . PC9a_3 Aerosol spray can . PC15_3 Aerosol spray can PC24_1 Liquids : Covers use in room size of 34 m³.

Ventilation rate
Covers use under typical household ventilation. Unless otherwise stated. PC4_1 Washing car window . PC4_2 Pouring into radiator . PC4_3 Lock de-icer . PC9a_3 Aerosol spray can . PC15_3 Aerosol spray can . PC24_1 Liquids : Covers use in a one car garage (34 m³) under typical ventilation.

Other given operational conditions affecting Non-industrial exposure
No specific risk management measure identified beyond those operational conditions stated.

3. Exposure estimation (Environment 1)
Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)
Uses in Coatings - Consumer

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.

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate consumer exposures, unless otherwise indicated.

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario
Use in Cleaning Agents - Consumer

<table>
<thead>
<tr>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product name</strong></td>
</tr>
<tr>
<td><strong>EU REACH registration number</strong></td>
</tr>
</tbody>
</table>

1. Title of exposure scenario

| **Main title** | Use in Cleaning Agents - Consumer |
| **Process scope** | 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. |
| **Product category** | PC3 Air care products.  
PC4 Anti-freeze and de-icing products.  
PC8 Biocidal products  
PC9a Coatings and paints, thinners, paint removers.  
PC9b Fillers, putties, plasters, modelling clay.  
PC9c Finger paints.  
PC24 Lubricants, greases and release products.  
PC35 Washing and cleaning products  
PC38 Welding and soldering products, flux products |
| **Main sector** | SU21 Consumer uses |

Environment

| **Environmental release category** | ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)  
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) |

SPERC

| **ESVOC SPERC 8.4c.v1** |
Use in Cleaning Agents - Consumer

Product sub-category
- PC3_1 Air care, instant action (aerosol sprays)
- PC3_n Air care, instant action (aerosol sprays) - pesticidial - excipient only
- PC3_2 Air care, continuous action (solid and liquid)
- PC3_n Air care, continuous action (solid and liquid) - pesticidial - excipient only
- PC4_1 Washing car window
- PC4_2 Pouring into radiator
- PC4_3 Lock de-icer
- PC8_1 Laundry and dish-washing products
- PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
- PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
- PC9a_1 Water-borne latex wall paint
- PC9a_2 Solvent-rich, high-solid, water-borne paint
- PC9a_3 Aerosol spray can
- PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
- PC9b_1 Fillers and putty
- PC9b_2 Plasters and floor equalisers
- PC9b_3 Modelling clay
- PC24_1 Liquids
- PC24_2 Pastes
- PC24_3 Sprays
- PC35_1 Laundry and dish washing products
- PC35_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, carpet cleaners, metal cleaners)
- PC35_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

2. Conditions of use affecting exposure (Non-Industrial - Environment 1)

Amounts used
- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 360 tonnes/year
- Fraction of Regional tonnage used locally: 5.0E-04
- Annual site tonnage: 0.18 tonnes
- Maximum daily site tonnage: 0.49 kg/day

Frequency and duration of use
- Continuous release.
- Emission days: 365 days/year

Other given operational conditions affecting environmental exposure
- Emission factor - air: Release fraction to air from process (initial release prior to RMM): 0.95
- Emission factor - water: Release fraction to wastewater from process (initial release prior to RMM): 0.025
- Emission factor - soil: Release fraction to soil from process (initial release prior to RMM): 0.025

Environmental factors not influenced by risk management measures
- Dilution: Local freshwater dilution factor: 10
- Local marine water dilution factor: 100

Risk management measures
- STP type: Municipal STP.
# Use in Cleaning Agents - Consumer

## STP details
- Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
- Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 14 tonne/day
- Assumed domestic sewage treatment plant flow: 2000 m³/day

## 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.

## Conditions and measures related to external recovery of waste
### Recovery method
- External recovery and recycling of waste should comply with applicable local and/or national regulations.

## 2. Conditions of use affecting exposure (Non-Industrial - Health 1)
### Product characteristics
#### Physical state
- Liquid

#### Concentration details
- PC3_1 Air care, instant action (aerosol sprays) . PC3_n Air care, instant action (aerosol sprays) - pesticidal - excipient only . PC3_n Air care, continuous action (solid and liquid) - pesticidal - excipient only . PC4_3 Lock de-icer . PC9a_3 Aerosol spray can . PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover) . PC24_3 Sprays : Covers concentrations up to 50 %. PC3_2 Air care, continuous action (solid and liquid) . PC4_2 Pouring into radiator : Covers concentrations up to 10 %. PC4_1 Washing car window . PC9b_3 Modelling clay : Covers concentrations up to 1 %. PC8_1 Laundry and dish-washing products . PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners ) . PC35_1 Laundry and dish washing products . PC35_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, carpet cleaners, metal cleaners) : Covers concentrations up to 5 %. PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) . PC35_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) : Covers concentrations up to 15 %. PC9a_1 Water-borne latex wall paint : Covers concentrations up to 1.5 %. PC9a_2 Solvent-rich, high-solid, water-borne paint : Covers concentrations up to 27.5 %. PC9b_1 Fillers and putty . PC9b_2 Plasters and floor equalisers : Covers concentrations up to 2 %. PC9c Finger paints : Covers concentrations up to 50 %. Avoid using at a product concentration greater than 5%. PC24_1 Liquids : Covers concentrations up to 100 %. PC24_2 Pastes . PC38 Welding and soldering products, flux products : Concentration of substance in product: 20%

### Amounts used
Use in Cleaning Agents - Consumer

PC3_1 Air care, instant action (aerosol sprays)
For each use event, covers use amounts up to 0.1 g.

PC3_n Air care, instant action (aerosol sprays) - pesticidial - excipient only
For each use event, covers use amounts up to 5 g.

PC3_2 Air care, continuous action (solid and liquid)
For each use event, covers use amounts up to 0.48 g.

PC3_n Air care, continuous action (solid and liquid) - pesticidial - excipient only
For each use event, covers use amounts up to 0.48 g.

PC4_1 Washing car window
For each use event, covers use amounts up to 0.5 g.

PC4_2 Pouring into radiator
For each use event, covers use amounts up to 2000 g.

PC4_3 Lock de-icer
For each use event, covers use amounts up to 4 g.

PC8_1 Laundry and dish-washing products
For each use event, covers use amounts up to 15 g.

PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
For each use event, covers use amounts up to 27 g.

PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
For each use event, covers use amounts up to 35 g.

PC9a_1 Water-borne latex wall paint
For each use event, covers use amounts up to 2760 g.

PC9a_2 Solvent-rich, high-solid, water-borne paint
For each use event, covers use amounts up to 744 g.

PC9a_3 Aerosol spray can
For each use event, covers use amounts up to 215 g.

PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
For each use event, covers use amounts up to 491 g.

PC9b_1 Fillers and putty
For each use event, covers use amounts up to 85 g.

PC9b_2 Plasters and floor equalisers
For each use event, covers use amounts up to 13.8 kg.

PC24_1 Liquids
For each use event, covers use amounts up to 2200 g.

PC24_2 Pastes
For each use event, covers use amounts up to 34 g.
Use in Cleaning Agents - Consumer

PC24_3 Sprays
For each use event, covers use amounts up to 73 g.

PC35_1 Laundry and dish washing products
For each use event, covers use amounts up to 15 g.

PC35_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, carpet cleaners, metal cleaners)
For each use event, covers use amounts up to 27 g.

PC35_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
For each use event, covers use amounts up to 35 g.

PC38 Welding and soldering products, flux products
For each use event, covers use amounts up to 12 g.

Frequency and duration of use
Use in Cleaning Agents - Consumer

PC3_1 Air care, instant action (aerosol sprays)
Covers use up to 365 days/year.
Covers use up to 4 time(s)/day.
Covers exposure up to 0.25 hours per event.

PC3_n Air care, instant action (aerosol sprays) - pesticidial - excipient only
Covers use up to 365 days/year.
Covers use up to 4 time(s)/day.
Covers exposure up to 0.25 hours per event.

PC3_2 Air care, continuous action (solid and liquid)
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 8.00 hours per event.

PC3_n Air care, continuous action (solid and liquid) - pesticidial - excipient only
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 8.00 hours per event.

PC4_1 Washing car window
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.02 hours per event.

PC4_2 Pouring into radiator
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.17 hours per event.

PC4_3 Lock de-icer
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.25 hours per event.

PC8_1 Laundry and dish-washing products
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.50 hours per event.

PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)
Covers use up to 128 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.33 hours per event.

PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
Covers use up to 128 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.17 hours per event.

PC9a_1 Water-borne latex wall paint
Covers use up to 4 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 2.20 hours per event.
Use in Cleaning Agents - Consumer

- PC9a_2 Solvent-rich, high-solid, water-borne paint
  Covers use up to 6 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.20 hours per event.

- PC9a_3 Aerosol spray can
  Covers use up to 2 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 0.33 hours per event.

- PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover)
  Covers use up to 3 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.00 hours per event.

- PC9b_1 Fillers and putty
  Covers use up to 12 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 4.00 hour per event.

- PC9b_2 Plasters and floor equalisers
  Covers use up to 12 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 2.00 hours per event.

- PC9b_3 Modelling clay
  Covers use up to 365 days/year.
  Covers use up to 1 time(s)/day.

- PC9c Finger paints
  Covers use up to 365 days/year.
  Covers use up to 1 time(s)/day.

- PC24_1 Liquids
  Covers use up to 4 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 0.17 hours per event.

- PC24_2 Pastes
  Covers use up to 10 days/year.
  Covers use up to 1 time(s)/day.

- PC24_3 Sprays
  Covers use up to 6 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 0.17 hours per event.

- PC35_1 Laundry and dish washing products
  Covers use up to 365 days/year.
  Covers use up to 1 time(s)/day.
  Covers exposure up to 0.50 hours per event.

- PC35_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, carpet cleaners, metal cleaners)
Use in Cleaning Agents - Consumer

Covers use up to 128 days/year. Covers use up to 1 time(s)/day. Covers exposure up to 0.33 hours per event.

PC35_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)
Covers use up to 128 days/year. Covers use up to 1 time(s)/day. Covers exposure up to 0.17 hours per event.

PC38 Welding and soldering products, flux products
Covers use up to 365 days/year. Covers use up to 1 time(s)/day. Covers exposure up to 1.00 hour per event.

Human factors not influenced by risk management

Potentially exposed body parts
PC3_2 Air care, continuous action (solid and liquid). PC3_n Air care, continuous action (solid and liquid) - pesticidal - excipient only: Covers skin contact area up to 35.70 cm². PC4_2 Pouring into radiator. PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners). PC35_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners): Covers skin contact area up to 428.00 cm². PC4_3 Lock de-icer: Covers skin contact area up to 214.40 cm². PC8_1 Laundry and dish-washing products. PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners). PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover). PC9b_2 Plasters and floor equalisers. PC35_1 Laundry and dish washing products. PC35_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, carpet cleaners, metal cleaners): Covers skin contact area up to 857.50 cm². PC9a_1 Water-borne latex wall paint. PC9a_2 Solvent-rich, high-solid, water-borne paint. PC24_3 Sprays: Covers skin contact area up to 428.75 cm². PC9b_1 Fillers and putty: Covers skin contact area up to 35.73 cm². PC9b_3 Modelling clay: Covers skin contact area up to 254.40 cm². PC24_2 Pastes: Covers skin contact area up to 468.00 cm².

PC9b_3 Modelling clay: For each use event, assumes swallowed amount of (g): 1 g. PC9c Finger paints: For each use event, assumes swallowed amount of (g): 1.35 g.

Other given operational conditions affecting Non-industrial exposure

Temperature
Assumes activities are at ambient temperature (unless stated differently).

Room size
PC3_1 Air care, instant action (aerosol sprays). PC3_n Air care, instant action (aerosol sprays) - pesticidal - excipient only. PC3_2 Air care, continuous action (solid and liquid). PC3_n Air care, continuous action (solid and liquid) - pesticidal - excipient only. PC8_1 Laundry and dish-washing products. PC8_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners). PC8_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners). PC9a_1 Water-borne latex wall paint. PC9a_2 Solvent-rich, high-solid, water-borne paint. PC9a_4 Removers (paint-, glue-, wallpaper-, sealant-remover). PC9b_1 Fillers and putty. PC9b_2 Plasters and floor equalisers. PC24_3 Sprays. PC35_1 Laundry and dish washing products. PC35_2 Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, carpet cleaners, metal cleaners). PC35_3 Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners). PC38 Welding and soldering products, flux products: Covers use in room size of 20 m³. PC4_1 Washing car window. PC4_2 Pouring into radiator. PC4_3 Lock de-icer. PC9a_3 Aerosol spray can. PC24_1 Liquids: Covers use in room size of 34 m³.

Ventilation rate
Covers use under typical household ventilation. Unless otherwise stated. PC4_1 Washing car window. PC4_2 Pouring into radiator. PC4_3 Lock de-icer. PC9a_3 Aerosol spray can. PC24_1 Liquids: Covers use in a one car garage (34 m³) under typical ventilation.
Use in Cleaning Agents - Consumer

Other given operational conditions affecting Non-industrial exposure

No specific risk management measure identified beyond those operational conditions stated.

<table>
<thead>
<tr>
<th>3. Exposure estimation (Environment 1)</th>
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<tbody>
<tr>
<td><strong>Assessment method</strong></td>
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<tr>
<td>Used Petrorisk model. (Hydrocarbon Block Method)</td>
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<th>4. Guidance to check compliance with the exposure scenario (Health 1)</th>
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<td>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</td>
</tr>
</tbody>
</table>
Exposure scenario
Use as a Blowing Agent - Industrial

Identification

Product name  Hydrocarbons, C5, n-alkanes, isoalkanes

EU REACH registration number  01-2119474207-37-0002

1. Title of exposure scenario

Main title  Use as a Blowing Agent - Industrial

Process scope  Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing

Main sector  SU3 Industrial uses

Environment

Environmental release category  ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

SPERC  ESVOC SPERC 4.9.v1

Worker

Process category  PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

PROC12 Use of blow agents in manufacture of foam.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 8300 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 8300 tonnes
Maximum daily site tonnage: 28 tonnes

Frequency and duration of use

Continuous release.
Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air  Release fraction to air from process (initial release prior to RMM): 1.0

Emission factor - water  Release fraction to wastewater from process (initial release prior to RMM): 3.0E-04

Emission factor - soil  Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures
Use as a Blowing Agent - Industrial

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures
Good practice
Common practices vary across sites, thus conservative process release estimates used.

STP type
Municipal STP.

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 800 tonne/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of 0%.

Water
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite waste water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%) ≥ 0.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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.

Conditions and measures related to external recovery of waste

Recovery method
External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used
Not applicable.

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting
Assumes a good basic standard of occupational hygiene is implemented.

Temperature
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures
Use as a Blowing Agent - Industrial

Bulk transfers
Limit the substance content in the product to 25%.

- Mixing operations
(closed systems)
No specific measures identified.

- Extrusion and expansion of polymer mass
No specific measures identified.

- Cutting and shaving
No specific measures identified.

- Collection and re-processing of shavings, cuttings, etc.
No specific measures identified.

- Product packaging
No specific measures identified.

- Storage
No specific measures identified.

- Mixing operations
(closed systems)
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

- Intermediate polymer storage
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

- Centrifuging, including discharging
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

- Drying and storage
No specific measures identified.

- Semi-bulk packaging
No specific measures identified.

- Treatment by heating
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

- Article formation in mould
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

- Cutting by heated wire
Manual
No specific measures identified.

- Mixing operations
(closed systems)
Use as a Blowing Agent - Industrial

No specific measures identified.

- Drum and small package filling
  Filling/preparation of equipment from drums or containers. No specific measures identified.

- Foaming
  No specific measures identified.

- Compression
  No specific measures identified.

- Cutting by heated wire
  No specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
# Exposure scenario
## Use as Functional Fluids - Industrial

### Identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>Hydrocarbons, C5, n-alkanes, isoalkanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU REACH registration number</td>
<td>01-2119474207-37-0002</td>
</tr>
</tbody>
</table>

### 1. Title of exposure scenario

<table>
<thead>
<tr>
<th>Main title</th>
<th>Use as Functional Fluids - Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process scope</td>
<td>Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment, including maintenance and related material transfers.</td>
</tr>
<tr>
<td>Main sector</td>
<td>SU3 Industrial uses</td>
</tr>
<tr>
<td>Environment</td>
<td></td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC7 Use of functional fluid at industrial site</td>
</tr>
<tr>
<td>SPERC</td>
<td>ESVOC SPERC 7.13a.v1</td>
</tr>
</tbody>
</table>

### Worker

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

### 2. Conditions of use affecting exposure (Industrial - Environment 1)

#### Amounts used

- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 10 tonnes/year
- Fraction of Regional tonnage used locally: 1
- Annual site tonnage: 10 tonnes
- Maximum daily site tonnage: 500 kg

#### Frequency and duration of use

- Continuous release.
- Emission days: 20 days/year

#### Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Emission factor - air</th>
<th>Release fraction to air from process (initial release prior to RMM): 1.0E-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission factor - water</td>
<td>Release fraction to wastewater from process (initial release prior to RMM): 3.0E-04</td>
</tr>
<tr>
<td>Emission factor - soil</td>
<td>Release fraction to soil from process (initial release prior to RMM): 1.0E-03</td>
</tr>
</tbody>
</table>

#### Environmental factors not influenced by risk management measures
Use as Functional Fluids - Industrial

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice
Common practices vary across sites, thus conservative process release estimates used.

STP type
Municipal STP.

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 1200 tonne/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of 0%.

Water
Risk from environmental exposure is driven by fresh water. Prevent discharge of undissolved substance to or recover from onsite waste water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 0.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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.

Conditions and measures related to external recovery of waste

Recovery method
External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used
Not applicable.

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting
Assumes a good basic standard of occupational hygiene is implemented.

Temperature
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures
Use as Functional Fluids - Industrial

Bulk transfers
(closed systems)
No specific measures identified.

Drum/batch transfers
No specific measures identified.

Filling of articles/equipment
(closed systems)
No specific measures identified.

Filling/preparation of equipment from drums or containers.
No specific measures identified.

General exposures (closed systems)
No specific measures identified.

General exposures (open systems)
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

Remanufacture of reject articles
No specific measures identified.

Equipment cleaning and maintenance
No specific measures identified.

Storage
No specific measures identified.

3. Exposure estimation (Environment 1)
Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)
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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)
Assessment method
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)
Use as Functional Fluids - Industrial

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario
Use as Functional Fluids - Professional

<table>
<thead>
<tr>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
</tr>
<tr>
<td>EU REACH registration number</td>
</tr>
</tbody>
</table>

1. Title of exposure scenario

<table>
<thead>
<tr>
<th>Main title</th>
<th>Use as Functional Fluids - Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process scope</td>
<td>Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment, including maintenance and related material transfers.</td>
</tr>
<tr>
<td>Main sector</td>
<td>SU22 Professional uses</td>
</tr>
</tbody>
</table>

Environment

<table>
<thead>
<tr>
<th>Environmental release category</th>
<th>ERC9a Widespread use of functional fluid (indoor)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ERC9b Widespread use of functional fluid (outdoor)</td>
</tr>
<tr>
<td>SPERC</td>
<td>ESVOC SPERC 9.13b.v1</td>
</tr>
</tbody>
</table>

Worker

<table>
<thead>
<tr>
<th>Process category</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</td>
</tr>
<tr>
<td>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</td>
</tr>
<tr>
<td>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</td>
</tr>
<tr>
<td>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</td>
</tr>
<tr>
<td>PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td>PROC20 Use of functional fluids in small devices</td>
</tr>
</tbody>
</table>

2. Conditions of use affecting exposure (Industrial - Environment 1)

<table>
<thead>
<tr>
<th>Amounts used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of EU tonnage used in region: 0.1</td>
</tr>
<tr>
<td>Regional use tonnage: 10 tonnes/year</td>
</tr>
<tr>
<td>Fraction of Regional tonnage used locally: 1</td>
</tr>
<tr>
<td>Annual site tonnage: 5.0E-03 tonnes</td>
</tr>
<tr>
<td>Maximum daily site tonnage: 1.4E-02 kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency and duration of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous release.</td>
</tr>
<tr>
<td>Emission days: 365 days/year</td>
</tr>
</tbody>
</table>

Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Emission factor - air</th>
<th>Release fraction to air from process (initial release prior to RMM): 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission factor - water</td>
<td>Release fraction to wastewater from process (initial release prior to RMM): 0.025</td>
</tr>
<tr>
<td>Emission factor - soil</td>
<td>Release fraction to soil from process (initial release prior to RMM): 0.025</td>
</tr>
</tbody>
</table>

Environmental factors not influenced by risk management measures

52/62
Use as Functional Fluids - Professional

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice
Common practices vary across sites, thus conservative process release estimates used.

STP type
Municipal STP.

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMWs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 780 kg/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of N/A%.

Water
Risk from environmental exposure is driven by fresh water. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 0.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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.

Conditions and measures related to external recovery of waste

Recovery method
External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used
Not applicable.

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting
Assumes a good basic standard of occupational hygiene is implemented.

Temperature
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures
Use as Functional Fluids - Professional

Drum/batch transfers
No specific measures identified.

Transfer from/pouring from containers
No specific measures identified.

Filling/preparation of equipment from drums or containers.
No specific measures identified.

General exposures (closed systems)
No specific measures identified.

General exposures (open systems)
Operation is carried out at elevated temperature (> 20°C above ambient temperature).
No specific measures identified.

Remanufacture of reject articles
No specific measures identified.

Equipment maintenance
No specific measures identified.

Storage
No specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario
Other Consumer Uses - Consumer

Identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>Hydrocarbons, C5, n-alkanes, isoalkanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU REACH registration number</td>
<td>01-2119474207-37-0002</td>
</tr>
</tbody>
</table>

1. Title of exposure scenario

Main title
Other Consumer Uses - Consumer

Process scope
Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: for cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

Product category
PC28 Perfumes, fragrances.
PC39 Cosmetics, personal care.

Main sector
SU21 Consumer uses

Environment

Environmental release category
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

SPERC
ESVOC SPERC 8.16.v1

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Amounts used
Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 5.0 tonnes/year
Fraction of Regional tonnage used locally: 5.0E-04
Annual site tonnage: 2.5E-03 tonnes
Maximum daily site tonnage: 6.8E-03 kg

Frequency and duration of use
Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air
Release fraction to air from process (initial release prior to RMM): 0.95

Emission factor - water
Release fraction to wastewater from process (initial release prior to RMM): 0.025

Emission factor - soil
Release fraction to soil from process (initial release prior to RMM): 0.025

Environmental factors not influenced by risk management measures

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP type
Municipal STP.
Other Consumer Uses - Consumer

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 400 kg/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

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.

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

2. Conditions of use affecting exposure (Non-Industrial - Health 1)
Product characteristics
Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used
For each use event, covers use amounts up to 37.5 kg.
Unless otherwise stated.

Frequency and duration of use
Covers exposure up to 2 hours per event.
Unless otherwise stated.

Human factors not influenced by risk management
Potentially exposed body parts
Covers skin contact area up to 420 cm². Unless otherwise stated.

3. Exposure estimation (Environment 1)
Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)
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.

3. Exposure estimation (Health 1)
Assessment method
The ECETOC TRA tool has been used to estimate consumer exposures, unless otherwise indicated.

4. Guidance to check compliance with the exposure scenario (Health 1)
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
**Exposure scenario**

**Use in Laboratories - Industrial**

### Identification

**Product name**
Hydrocarbons, C5, n-alkanes, isoalkanes

**EU REACH registration number**
01-2119474207-37-0002

### 1. Title of exposure scenario

**Main title**
Use in Laboratories - Industrial

**Process scope**
Use of the substance within laboratory settings, including material transfers and equipment cleaning.

**Main sector**
SU3 Industrial uses

### Environment

**Environmental release category**
ERC2 Formulation into mixture

**ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)**

**SPERC**
Not applicable.

### Worker

**Process category**
PROC10 Roller application or brushing

PROC15 Use as laboratory reagent.

### 2. Conditions of use affecting exposure (Industrial - Environment 1)

#### Amounts used

- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 0.80 tonnes/year
- Fraction of Regional tonnage used locally: 1
- Annual site tonnage: 0.80 tonnes
- Maximum daily site tonnage: 40 kg

#### Frequency and duration of use

- Continuous release.
- Emission days: 20 days/year

#### Other given operational conditions affecting environmental exposure

**Emission factor - air**
Release fraction to air from process (initial release prior to RMM): 0.025

**Emission factor - water**
Release fraction to wastewater from process (initial release prior to RMM): 0.02

**Emission factor - soil**
Release fraction to soil from process (initial release prior to RMM): 1.0E-04

#### Environmental factors not influenced by risk management measures

**Dilution**
Local freshwater dilution factor: 10

Local marine water dilution factor: 100

#### Risk management measures

**Good practice**
Common practices vary across sites, thus conservative process release estimates used.

**STP type**
Municipal STP.
Use in Laboratories - Industrial

**STP details**
- Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
- Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96.0%
- Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 18 tonne/day
- Assumed domestic sewage treatment plant flow: 2000 m³/day

**Technical onsite conditions and measures to reduce or limit discharges to air, water and soil**

**Air**
- Treat air emission to provide a typical removal efficiency of 0%.

**Water**
- Risk from environmental exposure is driven by freshwater sediment. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 0.0. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ 0.0%.

**Soil**
- Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

**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.

**Conditions and measures related to external recovery of waste**

**Recovery method**
- External recovery and recycling of waste should comply with applicable local and/or national regulations.

---

2. **Conditions of use affecting exposure (Workers - Health 1)**

**Product characteristics**

**Physical state**
- Liquid

**Concentration details**
- Covers percentage substance in the product up to 100% (unless stated differently).

**Amounts used**
- Not applicable.

**Frequency and duration of use**
- Covers daily exposures up to 8 hours (unless stated differently).

**Other given operational conditions affecting workers exposure**

**Setting**
- Assumes a good basic standard of occupational hygiene is implemented.

**Temperature**
- Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Risk management measures**

- Laboratory activities
  - No specific measures identified.
- Cleaning
  - No specific measures identified.

---

3. **Exposure estimation (Environment 1)**

**Assessment method**
- Used Petrorisk model. (Hydrocarbon Block Method)

4. **Guidance to check compliance with the exposure scenario (Environment 1)**
Use in Laboratories - Industrial

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 onsite technologies, either alone or in combination.

3. Exposure estimation (Health 1)

**Assessment method**
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario
Use in Laboratories - Professional

Identification

Product name
Hydrocarbons, C5, n-alkanes, isoalkanes

EU REACH registration number
01-2119474207-37-0002

1. Title of exposure scenario

Main title
Use in Laboratories - Professional

Process scope
Use of the substance within laboratory settings, including material transfers and equipment cleaning.

Main sector
SU22 Professional uses

Environment

Environmental release category
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

SPERC
ESVOC SPERC 8.17.v1

Worker

Process category
PROC10 Roller application or brushing
PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used
Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 0.80 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 4.0E-04 tonnes
Maximum daily site tonnage: 1.1E-03 kg

Frequency and duration of use
Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air
Release fraction to air from process (initial release prior to RMM): 0.5

Emission factor - water
Release fraction to wastewater from process (initial release prior to RMM): 0.5

Emission factor - soil
Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice
Common practices vary across sites, thus conservative process release estimates used.

STP type
Municipal STP.
Use in Laboratories - Professional

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant)
RMMs: 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater
treatment removal: 61 kg/day
Assumed domestic sewage treatment plant flow: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of 0%.

Water
Risk from environmental exposure is driven by fresh water. Treat onsite wastewater (prior to
receiving water discharge) to provide the required removal efficiency of (%) ≥ 0.0. If
discharging to domestic sewage treatment plant, provide the required onsite wastewater
removal efficiency of ≥ 0.0%.

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or
reclaimed.

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.

Conditions and measures related to external recovery of waste

Recovery method
External recovery and recycling of waste should comply with applicable local and/or national
regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used
Not applicable.

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting
Assumes a good basic standard of occupational hygiene is implemented.

Temperature
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Laboratory activities
No specific measures identified.

Cleaning
No specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)
Use in Laboratories - Professional

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 onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

| Assessment method | The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated |

4. Guidance to check compliance with the exposure scenario (Health 1)

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