

XYLENE ISOMERS
Code : 17209
SECTION 1. Identification of the substance/mixture and of the company/undertaking
1.1. Product identifier

Chemical description : Dimethyl benzene , Xylene (mixture).
 Type of product : Complex substance .
 Reach registration number : 01-2119488216-32

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

Identified use(s) : See table on the front page of the annex.
 Use(s) advised against : This product is not recommended for any industrial, professional or consumer use other than identified in table on the front page of the annex.

1.3. Details of the supplier of the safety data sheet

* Company identification : BRENNTAG N.V. - Nijverheidslaan 38 - BE-8540 DEERLIJK
 TEL: +32(0)56/77.69.44 - FAX: +32(0)56/77.57.11
 E-MAIL: info@brenntag.be - Website: www.brenntag.be

BRENNTAG Nederland B.V. - Donker Duyvisweg 44 - NL-3316 BM DORDRECHT
 TEL: +31(0)78/65.44.944 - FAX: +31(0)78/65.44.919
 E-MAIL: info@brenntag.nl - Website: www.brenntag.nl

1.4. Emergency telephone number

* Emergency phone number : België : Antipoison Center - Brussels
 TEL: +32(0)70/245.245

The Netherlands : National Poisoning Information Center - Bilthoven
 TEL: +31(0)30/274.88.88 (Only for the purpose of informing medical personnel in cases of acute intoxications)

SECTION 2. Hazards identification
2.1. Classification of the substance or mixture
Classification according to Directive 67/548/EEC or 1999/45/EC

Flammable (-; R10)
 Harmful (Xn; R20/21-R48/20-R65)
 Irritant (Xi; R36/37/38)

Classification according to Regulation (EC) No 1272/2008

Flammable liquids - Category 3 - Warning (Flam. Liq. 3; H226)
 Aspiration hazard - Category 1 - Danger (Asp. Tox. 1; H304)
 Acute toxicity, dermal - Category 4 - Warning (Acute Tox. 4, dermal; H312)
 Skin irritation - Category 2 - Warning (Skin Irrit. 2; H315)
 Eye irritation - Category 2 - Warning (Eye Irrit. 2; H319)
 Acute toxicity, inhalation - Category 4 - Warning (Acute Tox. 4, inhalation; H332)
 Specific Target Organ Toxicity - Single exposure - Respiratory tract irritation - Category 3 - Warning (STOT SE 3; H335)
 Specific Target Organ Toxicity - Repeated exposure - Category 2 - Warning (STOT RE 2; H373)

2.2. Label elements
Label in accordance with Regulation (EC) No 1272/2008

• Dangerous ingredient(s) : Xylene (mix)
 • Hazard pictogram(s)



• Signal word : Danger

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SECTION 2. Hazards identification (continued)

- Hazard statements : H226 - Flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. H312 - Harmful in contact with skin. H315 - Causes skin irritation. H319 - Causes serious eye irritation. H332 - Harmful if inhaled. H335 - May cause respiratory irritation. H373 - May cause damage to organs through prolonged or repeated exposure.
- Precautionary statements
 - Prevention : P210 - Keep away from heat, sparks, open flames or hot surfaces. – No smoking. P260 - Do not breathe dust, fume, gas, mist, vapours, spray. P280 - Wear protective gloves, protective clothing, eye protection, face protection.
 - Response : P301+P310 - IF SWALLOWED : Immediately call a POISON CENTER or doctor. P303+P361+P353 - IF ON SKIN (or hair) : Remove immediately all contaminated clothing. Rinse skin with water/shower. P331 - Do NOT induce vomiting.
 - Storage : P403+P235 - Store in well-ventilated place. Keep cool.

2.3. Other hazards

- Physical/chemical hazards : Floats on the water and may ignite again .
- Hazards for the health : A health dangerous concentration in the air will very quickly be reached by evaporation of this substance at app. 20°C; even faster by spraying. Suspected of damaging the unborn child.
- Hazards for the environment : No significant danger. This product is no substance or contains no PBT or vPvB (in accordance with Annex XIII).
- Hazards for the safety : At or above flash point, available vapours may burn in open or explode if confined when mixed with air and exposed to ignition source.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

* HARMFUL COMPONENT(S)

Name component(s)	Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
Xylene (mix)	: 80 -100 %	1330-20-7	215-535-7	601-022-00-9	01-2119488216-32	R10 Xn; R20/21-65-48/20 Xi; R36/37/38 ----- Flam. Liq. 3; H226 Asp. Tox. 1; H304 Acute Tox. 4 (skin); H312 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Acute Tox. 4 (inhal); H332 STOT SE 3; H335 STOT RE 2; H373
Ethyl benzene	: < 20 %	100-41-4	202-849-4	601-023-00-4	01-2119489370-35	F; R11 Xn; R20-65-48/20 Xi; R36/37/38 ----- Flam. Liq. 2; H225 Asp. Tox. 1; H304 Acute Tox. 4 (inhal); H332 STOT RE 2; H373
Toluene	: > 0.1 <= 1 %	108-88-3	203-625-9	601-021-00-3	01-2119471310-51	F; R11 Repr. Cat. 3; R63 Xn; R65-48/20 R67 Xi; R38 ----- Flam. Liq. 2; H225 Asp. Tox. 1; H304

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SECTION 3. Composition/information on ingredients (continued)

Skin Irrit. 2; H315
STOT SE 3; H336
Repr. 2; H361d
STOT RE 2; H373

The full text of the R-phrases and (EU)H-statements is in section 16.

Note C (Regulation (EC) No 1272/2008) applies to the product or one or more of its components.

Note: SCL applicable (Xylene (mix))

SECTION 4. First aid measures

4.1. Description of first aid measures

- | | |
|--------------------|---|
| General | : In case of doubt or persistent symptoms, call a physician.
Never give anything by mouth to an unconscious person. |
| First Aid Measures | |
| - Inhalation | : Remove victim into fresh air.
Allow the affected person to rest in semi-sitting position.
If not breathing, give artificial respiration.
Consult doctor or take patient to hospital immediately. |
| - Skin Contact | : Remove contaminated clothing.
Rinse skin immediately with plenty of water. (shower if necessary).
Consult a doctor. |
| - Eye Contact | : Rinse immediately thoroughly and long (at least 15 min.) with plenty of water.
Remove contact lenses.
Consult eye doctor. |
| - Ingestion | : DO NOT INDUCE VOMITING. Rinse mouth with water.
Take the patient IMMEDIATELY to the hospital. |

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

See section 11.

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

For specialist advice doctors should contact the NVCI or the Belgian Poison center.

SECTION 5. Firefighting measures

5.1. Extinguishing media

Extinguishing Media

- | | |
|------------------|--|
| - Suitable | : Extinguishing powder , Foam , Carbon dioxide (CO2) , Water spray . |
| - Not to be used | : Heavy water stream . |

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards : Fire may liberate carbon oxides (CO) and smoke.

5.3. Advice for firefighters

- | | |
|---|---|
| Special Protective Equipment for Firefighters | : Use self-contained breathing apparatus and wear protective clothes when in close proximity to fire. |
| Special Procedures | : Apply water spray or fog to cool nearby equipment. Avoid fire-fighting water to enter environment. |

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SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions : Eliminate every possible source of ignition (open fire, sparks, smoking, ...).
Evacuate all personnel immediately and ventilate area.
Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8)

6.2. Environmental precautions

Environmental Precautions : Shut off leaks if without risks.
Dike in the spilled product as much as possible with inert material.
Prevent entry of product in public water, sewers or soil.
Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for Cleaning Up : Collect the spillage in closable, suitable disposal containers.
Clean up any spills as soon as possible, using an inert absorbent material.
Residue is to be washed down with plenty of water.

6.4. Reference to other sections

For personal protection, see section 8.
For the removal of the waste product, see section 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Handling : Attention : SKIN ABSORPTION !
PREVENT EXPOSURE TO (PREGNANT) WOMAN.
AVOID FOG TRANSFORMATION !
Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8)
When using, do not eat, drink or smoke.
Wash hands before and after working with the product.
Emergency eye wash fountains and showers should be available in the immediate vicinity of any potential exposure.

7.2. Conditions for safe storage, including any incompatibilities

Storage : Keep only in the original, safely locked container in a cool, well ventilated and fireproof place.
All dangerous products should be placed on a drip tray or should be barreled.
Keep away from : Oxidizing agents , Strong acids .

Protection against Fire and Explosion : Eliminate every possible source of ignition (open fire, sparks, smoking, ...).
With a temperature equal to or higher than the flash point, the mixture steam-air may create a highly flammable and explosive mixture.
Heavier than air, vapours may travel long distances along ground, ignite and flash back to source.
Use special care to avoid static electric discharges.
Sufficiently earthen.
Use explosionproof equipment.
Use spark-arm implement.

Packaging Material : Stainless steel .

Insuitable Packaging Material : Rubber , Several synthetics .

7.3. Specific end use(s)

For identified uses, see subsection 1.2 and/or exposure scenarios.

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SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

- : For harmful components :
- Xylene (mix) : Limit value (BE) : 50 ppm (221 mg/m³) (2011) (D)
 - Xylene (mix) : Short time value (BE) : 100 ppm (442 mg/m³) (2011) (D)
 - Xylene (mix) : Limit value (TWA 8 h) (NL) : 50 ppm (210 mg/m³) (2008) (H)
 - Xylene (mix) : Limit value (TWA 15 min) (NL) : 100 ppm (442 mg/m³) (2008) (H)
 - Ethyl benzene : Limit value (BE) : 100 ppm (442 mg/m³) (2011) (D)
 - Ethyl benzene : Short time value (BE) : 125 ppm (551 mg/m³) (2011) (D)
 - Ethyl benzene : Limit value (TWA 8 h) (NL) : 50 ppm (215 mg/m³) (2008) (H)
 - Ethyl benzene : Limit value (TWA 15 min) (NL) : 100 ppm (430 mg/m³) (2008) (H)
 - Toluene : Limit value (BE) : 20 ppm (77 mg/m³) (2011) (D)
 - Toluene : Short time value (BE) : 100 ppm (384 mg/m³) (2011) (D)
 - Toluene : Limit value (TWA 8 h) (NL) : 40 ppm (150 mg/m³) (2007) (H)
 - Toluene : Limit value (TWA 15 min) (NL) : 100 ppm (384 mg/m³) (2007) (H)
- (D) The mention "D" means that the absorption of the agent by skin, mucous membranes or eyes constitutes an important part of the total exposition. This absorption can be the consequence of direct contact as well as his presence in the air.
- (H) The addition of an "H" indicates that the substance is relative easily absorbed by the skin.

Biological limit values

: They will be included when available.

DNELs

- : For harmful components :
- Xylene (mix) : Worker, acute - local effects, inhalation : 289 mg/m³
 - Xylene (mix) : Worker, acute - systemic effects, inhalation : 289 mg/m³
 - Xylene (mix) : Worker, long-term - systemic effects, inhalation : 77 mg/m³
 - Xylene (mix) : Worker, long-term - systemic effects, dermal : 180 mg/kg
 - Xylene (mix) : Consumer, acute - local effects, inhalation : 174 mg/m³
 - Xylene (mix) : Consumer, acute - systemic effects, inhalation : 174 mg/m³
 - Xylene (mix) : Consumer, long-term - systemic effects, inhalation : 14,8 mg/m³
 - Xylene (mix) : Consumer, long-term - systemic effects, dermal : 108 mg/kg
 - Ethyl benzene : Worker, long-term - systemic effects, inhalation : 77 mg/m³
 - Ethyl benzene : Worker, long-term - systemic effects, dermal : 180 mg/kg bw/ day
 - Ethyl benzene : Consumer, long-term - systemic effects, inhalation : 15 mg/m³
 - Ethyl benzene : Consumer, long-term - systemic effects, oral : 1,6 mg/kg bw/ day
 - Toluene : Worker, acute - local effects, inhalation : 384 mg/m³
 - Toluene : Worker, acute - systemic effects, inhalation : 384 mg/m³
 - Toluene : Worker, long-term - local effects, inhalation : 192 mg/m³
 - Toluene : Worker, long-term - systemic effects, inhalation : 192 mg/m³
 - Toluene : Worker, long-term - systemic effects, dermal : 384 mg/kg bw/ day
 - Toluene : Consumer, acute - local effects, inhalation : 226 mg/m³
 - Toluene : Consumer, acute - systemic effects, inhalation : 226 mg/m³
 - Toluene : Consumer, long-term - systemic effects, inhalation : 56,5 mg/m³
 - Toluene : Consumer, long-term - systemic effects, dermal : 226 mg/kg bw/ day
 - Toluene : Consumer, long-term - systemic effects, oral : 8,13 mg/kg bw/ day

PNECs

- : For harmful components :
- Xylene (mix) : Fresh water : 0,327 mg/l
 - Xylene (mix) : Marine water : 0,327 mg/l
 - Xylene (mix) : Fresh water sediment : 12,46 mg/kg
 - Xylene (mix) : Marine water sediment : 12,46 mg/kg
 - Xylene (mix) : Soil : 2,31 mg/kg
 - Xylene (mix) : Sewage treatment plant : 6,58 mg/l
 - Ethyl benzene : Fresh water : 0,1 mg/l
 - Ethyl benzene : Marine water : 0,01 mg/l
 - Ethyl benzene : Fresh water sediment : 13,7 mg/kg
 - Ethyl benzene : Marine water sediment : 1,37 mg/kg
 - Ethyl benzene : Soil : 2,68 mg/kg
 - Ethyl benzene : Intermittent release : 0,1 mg/l
 - Ethyl benzene : Sewage treatment plant : 9,6 mg/l

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SECTION 8. Exposure controls/personal protection (continued)

- Ethyl benzene : Oral : 0,02 g/kg
- Toluene : Fresh water : 0,68 mg/l
- Toluene : Marine water : 0,68 mg/l
- Toluene : Fresh water sediment : 16,39 mg/l
- Toluene : Marine water sediment : 16,39 mg/l
- Toluene : Soil : 2,89 mg/kg
- Toluene : Sewage treatment plant : 13,61 mg/l

8.2. Exposure controls

- | | |
|---------------------------------|--|
| Engineering Measures | : Ventilation , Local exhaust . |
| Personal Protection Equipment | |
| - Respiratory protection | : CE-approved mask for organic vapours and solvents (type A, brown). |
| - Skin protection | : Suitable protective clothing (Anti-static). |
| * - Hand protection | : Suitable material for safety gloves (EN 374):
The suitability of the gloves and the breakthrough time for a specific workplace should be discussed with the producers of the protective gloves. |
| | - material : Nitril rubber |
| | - thickness : 0,45 mm |
| | - breakthrough time : > 30' |
| - Eye/Face protection | : Closed safety glasses or face shield.
Eye protection (combined with respiratory protection equipment). |
| Environmental exposure controls | : See sections 6, 7, 12 and 13. |

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

- | | |
|--|---|
| Physical State (20°C) | : Liquid . |
| Form/Colour | : Clear , Colourless . |
| Odour | : Aromatic odour . |
| Odour threshold | : 0,27 ppm |
| pH value | : Not applicable. |
| Melting/Freezing point | : < -48 °C |
| Boiling Point/Range (1013 hPa) | : 136 - 145 °C |
| Flash point | : 23 - 29 °C |
| Fire hazard | : P2 |
| Evaporation rate | : 0,76 (Butyl acetate = 1)
13,5 (Diethyl ether =1) |
| Explosion limits in air | : 1,0 - 7,1 vol.% |
| Vapour pressure (20°C) | : 0,8 - 1,2 kPa |
| Relative vapour density (air=1) | : 3,7 |
| Relative density of saturated vapour/air mixture (air=1) | : 1,03 |
| Relative density (water=1) | : 0,9 |
| * Density (20°C) | : 0,87 g/cm ³ |
| Solubility in water | : app. 0,02 g/100 ml |
| Log P Octanol/Water (20°C) | : 3,1 |
| Auto-ignition temperature | : 432 - 530 °C |
| Minimum ignition energy | : 0,2 mJ |
| Decomposition temperature | : No data available. |

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SECTION 9. Physical and chemical properties (continued)

Viscosity (20°C) : < 0,9 mm²/s (Kinematic)
 Explosive properties : No chemical groups associated with explosive properties .
 Oxidizing properties : No chemical groups associated with oxidizing properties .

9.2. Other information

Surface tension (20°C) : 28,7 mN/m
 Specific leading : < 0,1 pS/m
 % Volatiles (by weight) : > 99

SECTION 10. Stability and reactivity

10.1. Reactivity

Reactivity : Reacts violently with oxidizing agents and strong acids.

10.2. Chemical stability

Stability : Stable at normal circumstances .

10.3. Possibility of hazardous reactions

Hazardous reactions : Vapor mixes readily with air forming explosive mixtures.

10.4. Conditions to avoid

Conditions to avoid : Heat, sparks, open flames and other ignition sources .

10.5. Incompatible materials

Materials to avoid : Oxidizing agents , Strong acids , Rubber , Several synthetics .

10.6. Hazardous decomposition products

Hazardous Decomposition Products : Carbon oxides , Hydrocarbons , Aldehydes .

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

- Inhalation : Harmful if inhaled.
 Exposure to high concentrations may cause lowering of consciousness.
 Symptoms include: Irritation , Sore throat , Cough , Excitement , Headache ,
 Dizziness , Weakness , Nausea .
 For harmful components :
 • Xylene (mix) : LC50 (Rat, inhalation, 4 h) : >20 mg/l
 • Ethyl benzene : LC50 (Rat, inhalation, 4 h) : >9,6 mg/l
 • Toluene : LC50 (Rat, inhalation, 4 h) : 28,1 mg/l

- Skin contact : Harmful in contact with skin. Product is being absorbed through the skin.
 Symptoms include: Dry skin , Redness , Rough skin .
 For harmful components :
 • Xylene (mix) : LD50 (Rabbit, dermal) : >2000 mg/kg
 • Ethyl benzene : LD50 (Rabbit, dermal) : >15000 mg/kg
 • Toluene : LD50 (Rabbit, dermal) : >5000 mg/kg

- Ingestion : After swallowing, some drops of liquid can enter the lungs (aspiration), which may
 cause pneumonia.
 Symptoms of lungedema mostly reveal after a few hours/days.
 Medical observation is necessary.
 Symptoms include: Irritation , Burning feeling , Stomach complaints , Nausea ,
 Vomiting , Shortness of breath , See "Inhalation" .
 For harmful components :
 • Xylene (mix) : LD50 (Rat, oral) : >2000 mg/kg

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SECTION 11. Toxicological information (continued)

Skin corrosion/irritation Serious eye damage/irritation Aspiration hazard Respiratory or skin sensitisation Carcinogenicity Mutagenicity Reproductive toxicity Specific target organ toxicity - single exposure Specific target organ toxicity - repeated exposure	• Ethyl benzene : LD50 (Rat, oral) : >3500 mg/kg • Toluene : LD50 (Rat, oral) : 5580 mg/kg : Causes skin irritation. Repeated or prolonged skin contact may cause dermatitis and defatting. Skin contact can damage eczema. : Causes serious eye irritation. : May be fatal if swallowed and enters airways. : Not sensitive . : Not listed as carcinogenic . IARC: Group 3 (undetectable carcinogenic to humans). : Not listed as mutagenic . : Not listed for reproductive toxicity . The Netherlands : Xylene and Toluene are included in the SZW list . : To human : Respiratory tract irritation . : To human : May cause damage to organs through prolonged or repeated exposure. Target organ(s) : Central nervous system , Hearing , Kidneys , Liver .
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SECTION 12. Ecological information

12.1. Toxicity

Ecotoxicity	: For harmful components : • Xylene (mix) : LC50 (Fish, 96 h) : 1-10 mg/l • Xylene (mix) : EC50 (Algae, 72 h) : 1-10 mg/l • Xylene (mix) : EC50 (Daphnia magna, 48 h) : 1-10 mg/l • Ethyl benzene : LC50 (Fish, 96 h) : >10 mg/l (Pimephales promelas) • Ethyl benzene : EC50 (Daphnia magna, 48 h) : >1,8 mg/l • Toluene : LC50 (Fish, 96 h) : 5,5 mg/l (Oncorhynchus kisutch) • Toluene : EC50 (Algae, 72 h) : 12,5 mg/l • Toluene : EC50 (Daphnia magna, 48 h) : 3,8 mg/l
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12.2. Persistence and degradability

Persistence and degradability	: For harmful components : • Xylene (mix) : Persistence and degradability : May biodegrade good. • Ethyl benzene : Persistence and degradability : Readily biodegradable . • Toluene : Persistence and degradability : Readily biodegradable .
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12.3. Bioaccumulative potential

Bioaccumulation	: For harmful components : • Xylene (mix) : Bioaccumulation : Little chance on bioaccumulation . • Ethyl benzene : Bioaccumulation : No bioaccumulation . • Toluene : Bioaccumulation : Bioaccumulation not expected .
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12.4. Mobility in soil

Mobility	: For harmful components : • Xylene (mix) : Mobility : Floats on the water . • Ethyl benzene : Mobility : Floats on the water . • Toluene : Mobility : Floats on the water .
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12.5. Results of PBT and vPvB assessment

Evaluation	: For harmful components : • Xylene (mix) : PBT/vPvB : No • Ethyl benzene : PBT/vPvB : No • Toluene : PBT/vPvB : No
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WGK class (DE)	: 2 (Water pollutant).
Water damaging (NL)	: 1
Decontamination exertion (NL)	: A (Contains Black list substance).
Photochemical ozone creation potential	: No data available.
Ozone depletion potential	: No data available.
Endocrine disrupting potential	: No data available.
Global warming potential	: No data available.

SECTION 13. Disposal considerations**13.1. Waste treatment methods**

Waste from residues/Unused products	: The product has to be destroyed according to national or local legislation, by a company specialised in handling hazardous waste products.
European list of waste products	: XXXXXX - European waste product code. This code is assigned on the basis of the most current applications and can not be representative for pollutions which are arisen at the effective use of the product. The producer of the waste has to evaluate its process himself and has to grant the appropriate waste coding. See Decision 2001/118/EC.
Removal contaminated packaging	: Packing is to be used exclusively for the packing of this product. After use, empty and close the packing very carefully. In case of returned packing, the empty packing can be offered back to the supplier.

SECTION 14. Transport information**14.1. UN number**

UN Number : 1307

14.2. UN proper shipping name

ADR Name : UN 1307 Xylenes, 3, III, (D/E)
ADN Name : UN 1307 Xylenes , 3, III
IMDG Name : UN 1307 Xylenes , 3, III, (23°C)
IATA Name : UN 1307 Xylenes , 3, III

14.3. Transport hazard classe(s)

Class : 3

14.4. Packing group

Packaging Group : III

14.5. Environmental hazards

Environmentally hazard : No
Marine pollutant : No

14.6. Special precautions for user

Danger number : 30
Hazard Label(s) : 3
EmS-N° : F-E , S-D

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

Type ship : 2

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SECTION 14. Transport information (continued)

Pollution category : Y

SECTION 15. Regulatory information

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

Inventories : Australian inventory (AICS): Listed in inventory.
 Canadian inventory (DSL): Listed in inventory.
 Chinese inventory (IECS): Listed in inventory.
 European inventory (EINECS): Listed in inventory.
 Japanese inventory (ENCS): Listed in inventory.
 Korean inventory (KECI): Listed in inventory.
 Philippine inventory (PICCS): Listed in inventory.
 Inventory of the United States (TSCA): Listed in inventory.

NFPA n° : 2-3-0

* Relevant EU Rule(s) : Directive 76/464/EEC of the Council of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community
 Directive 96/82/EC of the Council of 9 December 1996 on the control of major-accident hazards involving dangerous substances
 Directive 98/24/EC of the Council of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work
 Directive 1999/13/EC of the Council of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations
 Directive 2004/42/CE of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC
 Decision 2001/118/EC of the Commission of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes
 Regulation (EC) No 273/2004 of the European Parliament and of the Council of 11 February 2004 on drug precursors
 Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
 Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
 Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (Reach)

15.2. Chemical Safety Assessment

* A chemical safety assessment has been carried out for the components that make up this material.

SECTION 16. Other information

This safety data sheet has been drawn up in accordance with Regulation (EU) No 453/2010.
 This safety data sheet is exclusively made for industrial/professional use.

* Has changed compared to previous revision.

* Changes : Section 1 , Section 3 , Section 8 , Section 9 , Section 15 .
 Sources of used key data : The information contained herein is based on the present state of our knowledge (Producer(s) , Chemical cards , ...).
 See also on the webaddress:

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SECTION 16. Other information (continued)

- <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>
- R-phrase(s) : R10 - Flammable.
R11 - Highly flammable.
R20 - Harmful by inhalation.
R20/21 - Harmful by inhalation and in contact with skin.
R36/37/38 - Irritating to eyes, respiratory system and skin.
R38 - Irritating to skin.
R48/20 - Harmful : danger of serious damage to health by prolonged exposure through inhalation.
R63 - Possible risk of harm to the unborn child.
R65 - Harmful : may cause lung damage if swallowed.
R67 - Vapours may cause drowsiness and dizziness.
- * (EU)H-statement(s) : H225 - Highly flammable liquid and vapour.
H226 - Flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H312 - Harmful in contact with skin.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H332 - Harmful if inhaled.
H335 - May cause respiratory irritation.
H336 - May cause drowsiness or dizziness.
H361d - Suspected of damaging the unborn child.
H373 - May cause damage to organs through prolonged or repeated exposure.
- List of abbreviations and acronyms : ADN (Accord européen relatif au transport international des marchandises Dangereuses par voie de Navigation interieur) : European agreement concerning the international carriage of dangerous goods by inland waterways
ADR (Accord européen relatif au transport international des marchandises Dangereuses par Route) : European agreement concerning the international carriage of dangerous goods by road
CO : Carbon monoxide
DNEL (Derived No Effect Level) : an estimated safe exposure level
EmS (Emergency Schedule) : the first code refers to the relevant fire schedule and the second code refers to the relevant spillage schedule
IARC (International Agency for Research on Cancer)
IATA (International Air Transport Association) : provisions concerning the international carriage of dangerous goods by air
IMDG (International Maritime Dangerous Goods code)
NFPA (National Fire Protection Association) or fire diamant
NVCI : National Poisoning Information Center
PBT : persistent, bioaccumulative and toxic
PNEC (Predicted No Effect Concentration) : concentration below which exposure to a substance is not expected to cause adverse effects
REACH : Registration, Evaluation, Authorisation and restriction of Chemicals
SCL (Specific Concentration Limits)
SZW-list : Non-limitative list of reproduction toxic substances to which the additional registration obligation applies as referred to in Article 4.2a, second paragraph of the Working conditions decree
TWA (Time-Weighted Average) : the average exposure over a specified period
vPvB : very persistent and very bioaccumulative
WGK (Wassergefährdungsklasse) : a German classification of substances that indicate the environmental hazard for surface water
Black list : List I of Directive 76/464/EEC contains substances which belong to families and groups of substances, selected mainly on the basis of their toxicity, persistence and bioaccumulation, with the exception of those which are biologically harmless or which are rapidly converted into substances which are biologically harmless

XYLENE ISOMERS**Code : 17209**

This information is to our knowledge correct and complete on the date of issue of this safety data sheet. The information only concerns the product and does not give any guarantee for the quality and the completeness of the properties of the product, or in case of mixing or using in any other process. It remains the responsibility of the user to assure himself that the information is suitable and complete concerning the special use he makes of the product.

BRENNTAG denies all responsibility for loss or damage resulting from the use of these data.

End of document

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No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	NA	NA	1, 2, 3, 4, 8a, 8b, 15	1, 4	NA	ES541
2	Use as an intermediate	3	NA	NA	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES556
3	Distribution of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	1, 7	NA	ES670
4	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES681
5	Rubber production and processing	3	10	NA	1, 2, 3, 4, 5, 6, 7, 8a, 8b, 13, 14, 15, 21	1, 4, 6d	NA	ES936
6	Polymer production	3	10	NA	1, 2, 3, 4, 5, 6, 8a, 8b, 9, 13, 14, 21	4	NA	ES7893
7	Polymer processing	3	10	NA	1, 2, 3, 4, 8a, 8b, 16	7	NA	ES7851
8	Polymer processing	22	NA	NA	1, 2, 8a, 8b, 14, 21	8a, 8d	NA	ES7853
9	Uses in coatings	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 14, 15	4	NA	ES721
10	Uses in coatings	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES801
11	Uses in coatings	21	NA	1, 4, 8, 9a, 9b, 9c, 15, 18, 23, 24, 31, 34	NA	8a, 8d	NA	ES1293
12	Use in Cleaning Agents	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES804
13	Use in Cleaning Agents	22	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	8a, 8d	NA	ES808
14	Use in Cleaning Agents	21	NA	3, 4, 8, 9a, 24, 35, 38	NA	8a, 8d	NA	ES1369
15	Use as binders and release agents	3	8, 9	NA	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14	4	NA	ES818
16	Use as binders and release agents	22	NA	NA	1, 2, 3, 4, 6, 8a, 8b,	8a, 8d	NA	ES822

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					10, 11, 14			
17	Use in agrochemicals	22	NA	NA	1, 2, 4, 8a, 8b, 11, 13	8a, 8d	NA	ES826
18	Use in agrochemicals	21	NA	12, 27	NA	8a, 8d	NA	ES1385
19	Use as a fuel	3	10	NA	1, 2, 3, 8a, 8b, 16	7	NA	ES828
20	Use as a fuel	22	NA	NA	1, 2, 3, 8a, 8b, 16	9a, 9b	NA	ES830
21	Use as a fuel	21	NA	13	NA	9a, 9b	NA	ES7825
22	Use as lubricants	21	NA	1, 24, 31	NA	8a, 8d, 9a, 9b	NA	ES7835
23	Use as lubricants	3	10	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17	4, 7	NA	ES7888
24	Use as lubricants	22	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	8a, 8d, 9a, 9b	NA	ES7890
25	Use as Functional Fluids	21	NA	16, 17	NA	9a, 9b	NA	ES7833
26	Use as Functional Fluids	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9	7	NA	ES7863
27	Use as Functional Fluids	22	NA	NA	1, 2, 3, 8a, 20	9a, 9b	NA	ES7867
28	Use in laboratories	3	10	NA	10, 15	2, 4	NA	ES930
29	Use in laboratories	22	NA	NA	10, 15	8a	NA	ES932
30	Use in road and construction applications	22	NA	NA	8a, 8b, 9, 10, 11, 13	8d, 8f	NA	ES7874
31	Use in Oil and Gas field drilling and production operations	3	NA	NA	1, 2, 3, 4, 8a, 8b	4	NA	ES938
32	Use in Oil and Gas field drilling and production operations	22	NA	NA	1, 2, 3, 4, 8a, 8b	8d	NA	ES7876
33	Use as mining chemicals	3	8, 9	NA	1, 2, 3, 4, 5, 8b, 9	4	NA	ES7847
34	Explosives manufacture & use	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	2	NA	ES7861

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1. Short title of Exposure Scenario 1: Manufacture of substance

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Manufacture of substance or use as process chemical or extracting agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,5
	Annual amount per site	50000 ton(s)/year
	Maximum daily site tonnage (kg/day):	170000 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	40
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	0,01 %
	Emission or Release Factor: Soil	0,01 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 90 %)
	Water	Risk from environmental exposure is driven by

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		wastewater treatment plant microbes. If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m ³ /d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	During manufacturing no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
	General exposures (closed systems) Use in contained batch processes	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC3)
	General exposures (open systems) Batch process with sample collection	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Process sampling	provide a good standard of general ventilation (not
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		less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8b)
	Bulk transfers (open systems) with potential for aerosol generation	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Bulk transfers (closed systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 1.1v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management

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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.

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1. Short title of Exposure Scenario 2: Use as an intermediate

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
Activity	Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1 Contributing scenario controlling environmental exposure for: ERC6a

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,25
	Annual site tonnage (tons/year):	3750 ton(s)/year
	Maximum daily site tonnage (kg/day):	12500 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	0,3 %
	Emission or Release Factor: Soil	0,1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 80 %)
	Water	Prevent discharge of substance to wastewater or

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	This substance is consumed during use and no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Bulk transfers (open systems) with potential for aerosol generation	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	General exposures (closed systems) Use in contained batch processes	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC3)
	General exposures (open systems) Batch process with sample collection	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Process sampling	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8b)
	Bulk transfers	provide a good standard of general ventilation (not

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	(closed systems)	less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 6.1a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

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Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 3: Distribution of substance

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC7: Industrial use of substances in closed systems
Activity	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.

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC7

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	200 ton(s)/year
	Maximum daily site tonnage (kg/day):	670 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0,001 %
Technical conditions and	Air	Treat air emission to provide a typical removal

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measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		efficiency of (%): (Efficiency: 90 %)
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	municipal
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC9)
	General exposures (closed systems) Use in contained batch processes	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC3)
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	General exposures (open systems) Batch process with sample collection	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Process sampling	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour. or Handle substance within a closed system.(PROC8b)
	Bulk transfers (closed systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Bulk transfers (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
	Drum and small package filling	Transfer via enclosed lines.(PROC9)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 1.1b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 4: Formulation & (re)packing of substances and mixtures

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	ERC2: Formulation of preparations
Activity	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC2

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	10000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,25
	Annual site tonnage (tons/year):	3750 ton(s)/year
	Maximum daily site tonnage (kg/day):	12500 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release	0,2 %

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	Factor: Water	
	Emission or Release Factor: Soil	0,01 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Bulk transfers	Ensure material transfers are under containment or extract ventilation.(PROC8a, PROC8b)
	General exposures (closed systems) Use in contained batch processes	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC3)
	General exposures (open systems) Batch process with sample collection	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)

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	with potential for aerosol generation	
	Batch processes at elevated temperatures	Handle substance within a closed system. Provide extraction ventilation at points where emissions occur.(PROC3)
	Process sampling	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour. or Handle substance within a closed system.(PROC8b)
	Mixing operations (open systems) with potential for aerosol generation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC4, PROC5)
	Manual Transfer from/pouring from containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b, PROC9)
	Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b)
	Production of preparations or articles by tableting, compression, extrusion, pelettisation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Drum and small package filling	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC9)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 2.2.v1 has been used to evaluate the exposure for the environment

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Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 5: Rubber production and processing

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC6: Calendering operations</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p> <p>PROC15: Use as laboratory reagent</p> <p>PROC21: Low energy manipulation of substances bound in materials and/or articles</p>
Environmental Release Categories	<p>ERC1: Manufacture of substances</p> <p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p>
Activity	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4, ERC6d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	100 ton(s)/year
	Maximum daily site tonnage (kg/day):	333 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100

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Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	0,3 %
	Emission or Release Factor: Soil	0,01 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC13, PROC14, PROC15, PROC21		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Material transfers (open systems) Dedicated facility	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC8b)
	Small scale weighing	Ensure material transfers are under containment or extract ventilation.(PROC9)
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	Additive premixing Batch process (closed systems)	Provide extract ventilation to material transfer points and other openings.(PROC5)
	Additive premixing	Provide extraction ventilation at points where emissions occur.(PROC4)
	Material transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Calendering (including Banburys) Elevated temperature	Restrict area of openings to equipment. Provide extraction ventilation at points where emissions occur. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.
	Pressing uncured rubber blanks	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Vulcanisation Elevated temperature	Restrict area of openings to equipment. Provide extraction ventilation at points where emissions occur.(PROC6)
	Cooling cured articles	Provide extraction ventilation at points where emissions occur.
	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a, PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 4.19a.v1 has been used to evaluate the exposure for the environment

Workers

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The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 6: Polymer production

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC6: Calendering operations</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p> <p>PROC21: Low energy manipulation of substances bound in materials and/or articles</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Processing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4

No exposure assessment presented for the environment.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	25 %
	Emission or Release	0 %

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	Factor: Water	
	Emission or Release Factor: Soil	0,001 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 80 %)
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC21

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers Dedicated facility	Transfer via enclosed lines.(PROC8b)
	Bulk transfers (closed systems) with occasional controlled exposure	Handle substance within a closed system.(PROC2)
	Bulk transfers (closed systems)	Handle substance within a closed system.(PROC8a, PROC8b)
	Bulk weighing (closed systems)	Handle substance within a closed system.(PROC2)
	Small scale weighing	Ensure material transfers are under containment or extract ventilation.(PROC9)

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	Additive premixing (closed systems)	Ensure material transfers are under containment or extract ventilation.(PROC3, PROC4, PROC5)
	Additive premixing (closed systems) with sample collection	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3, PROC4, PROC5)
	Additive premixing General exposures (open systems)	Ensure material transfers are under containment or extract ventilation.(PROC3, PROC4, PROC5)
	Bulk transfers Drum/batch transfers	Transfer via enclosed lines.(PROC8a, PROC8b)
	Bulk transfers Small package filling	Transfer via enclosed lines.(PROC9)
	Calendering (including Banburys)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC6)
	Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Extrusion and masterbatching	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Injection moulding of articles	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Equipment maintenance	Drain down system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 7: Polymer processing

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Processing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC7

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	100 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 90 %)
	Water	Prevent discharge of substance to wastewater or

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	cleaning	Provide extract ventilation to points where emissions occur.(PROC8a, PROC8b)
	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a, PROC8b)
	Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	General exposures (closed systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	General exposures (closed systems) Batch process	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC3)

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	General exposures (closed systems) (open systems) Batch process	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)
	Disposal of wastes	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 7.12a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 8: Polymer processing

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC21: Low energy manipulation of substances bound in materials and/or articles
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Processing of formulated polymers including material transfers, moulding and forming activities, material re-works and associated maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98 %
	Emission or Release Factor: Water	1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	

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Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC8a, PROC8b, PROC14, PROC21

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Storage	Store substance within a closed system.(PROC2)
	Storage with occasional controlled exposure	Store substance within a closed system. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2)
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Bulk transfers (closed systems)	Handle substance within a closed system.(PROC8b)
	Bulk transfers (closed systems) with occasional controlled exposure	Handle substance within a closed system. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8b)
	Material transfers	Transfer via enclosed lines.(PROC8a, PROC8b)
	Injection moulding of articles	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC14)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.21b.v1 has been used to evaluate the exposure for the environment

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Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 9: Uses in coatings

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC4

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
	Maximum daily site tonnage (kg/day):	17000 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	9,8 %
	Emission or Release	0,7 %

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	Factor: Water	
	Emission or Release Factor: Soil	0 %
<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 90 %)
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
<p>Conditions and measures related to sewage treatment plant</p>	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
<p>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC14, PROC15</p>		
<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
<p>Frequency and duration of use</p>	Covers daily exposures up to 8 hours (unless stated differently).	
<p>Other operational conditions affecting workers exposure</p>	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
<p>Technical conditions and measures to control dispersion from source towards the worker</p>	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Film formation - force drying, stoving and other technologies	Provide extraction ventilation at points where emissions occur. Handle substance within a closed system.(PROC2)
	Mixing operations (closed systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC3)
	Film formation - air drying	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2, PROC3, PROC4)
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	Preparation of material for application Mixing operations (open systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC5)
	Spraying (automatic/robotic)	Carry out in a vented booth provided with laminar airflow.(PROC7)
	Manual Spraying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC7)
	Material transfers	Ensure material transfers are under containment or extract ventilation.(PROC8a, PROC8b, PROC9)
	Roller, spreader, flow application	Provide extraction ventilation at points where emissions occur.(PROC10)
	Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Drum/batch transfers Transfer from/pouring from containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b)
	Production of preparations or articles by tableting, compression, extrusion, pelettisation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
	Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Manual Spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)

3. Exposure estimation and reference to its source

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Environment

Used EUSES model., ESVOC spERC 4.3a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 10: Uses in coatings

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC15: Use as laboratory reagent</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,4 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98 %
	Emission or Release Factor: Water	1 %

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	Emission or Release Factor: Soil	1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
	Exposure duration per day	< 4 h (PROC8a, PROC8b, PROC13)
Other operational conditions affecting workers exposure	Limit the substance content in the mixture to 5 %.(PROC19)	
	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Filling / preparation of equipment from drums or containers	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC8a, PROC8b, PROC9)
	General exposures (closed systems) Use in contained systems	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC2)
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	Preparation of material for application Outdoor.	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Handle substance within a closed system. or Avoid carrying out operation for more than 1 hour.(PROC3, PROC5)
	Preparation of material for application Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Handle substance within a closed system. or Avoid carrying out operation for more than 1 hour.(PROC3, PROC5)
	Material transfers Drum/batch transfers	Transfer via enclosed lines. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Roller, spreader, flow application Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Manual Spraying Indoor	Carry out in a vented booth provided with laminar airflow.(PROC11)
	Dipping, immersion and pouring Indoor	Provide extraction ventilation at points where emissions occur. Avoid carrying out operation for more than 4 hours.(PROC13)
	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	Hand application - finger paints, pastels, Adhesives Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC19)
	Hand application - finger paints, pastels, Adhesives Outdoor.	Avoid carrying out operation for more than 4 hours.(PROC19)
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Avoid carrying out operation for more than 4 hours.(PROC8a, PROC8b)
	Storage	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Store substance within a closed system.(PROC2)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible.

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		Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Roller, spreader, flow application Indoor	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Roller, spreader, flow application Outdoor.	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Manual Spraying Outdoor.	Wear a full face respirator conforming to EN136 with type A filter or better Avoid carrying out operation for more than 4 hours.(PROC11)
	Dipping, immersion and pouring Outdoor.	Wear a respirator conforming to EN140 with Type A filter or better.(PROC13)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.3b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 11: Uses in coatings

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical 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 tanning, dye, finishing, impregnation and care products PC24: Lubricants, greases, release products PC31: Polishes and wax blends PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,4 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98,5 %
	Emission or Release Factor: Water	1 %
	Emission or Release Factor: Soil	0,5 %
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed	93,6 %

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	from waste water	
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling consumer exposure for: PC1, Glues, hobby use

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	9 g
Frequency and duration of use	Exposure duration	4 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.3 Contributing scenario controlling consumer exposure for: PC1, Glues DIY-use (carpet glue, tile glue, wood parquet glue)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 0,2%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	6,39 kg
Frequency and duration of use	Exposure duration	6 h
	Frequency of use	1 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,70 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.4 Contributing scenario controlling consumer exposure for: PC1, Glue from spray

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid

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	Vapour pressure	> 10 Pa
Amount used	Amount used per event	85,05 g
Frequency and duration of use	Exposure duration	4 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.5 Contributing scenario controlling consumer exposure for: PC1, Sealants

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	75 g
Frequency and duration of use	Exposure duration	1 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.6 Contributing scenario controlling consumer exposure for: PC4, Washing car window

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Exposure duration	0,02 h
	Frequency of use	365 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	

2.7 Contributing scenario controlling consumer exposure for: PC4, Pouring into radiator

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	2 kg

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Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
		Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.
2.8 Contributing scenario controlling consumer exposure for: PC4, Lock de-icer		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	4 g
Frequency and duration of use	Exposure duration	0,25 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 214,40 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
		Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.
2.9 Contributing scenario controlling consumer exposure for: PC8, Laundry and dish washing products		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	15 g
Frequency and duration of use	Exposure duration	0,50 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,50 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.
2.10 Contributing scenario controlling consumer exposure for: PC8, Cleaners, liquids		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	27 g
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Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	128 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,50 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m3
		Covers use at ambient temperatures., Covers use under typical household ventilation.
2.11 Contributing scenario controlling consumer exposure for: PC8, Cleaners, trigger sprays		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 15%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	128 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m3
		Covers use at ambient temperatures., Covers use under typical household ventilation.
2.12 Contributing scenario controlling consumer exposure for: PC9a, Waterborne latex wall paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Exposure duration	2,2 h
	Frequency of use	4 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m3
		Covers use at ambient temperatures., Covers use under typical household ventilation.
2.13 Contributing scenario controlling consumer exposure for: PC9a, Solvent rich, high solid, water borne paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
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Amount used	Amount used per event	744 g
Frequency and duration of use	Exposure duration	2,20 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	
2.14 Contributing scenario controlling consumer exposure for: PC9a, Aerosol spray can		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 21%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	215 g
Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	2 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use in a one car garage (34 m ³) under typical ventilation., Covers use at ambient temperatures.	
2.15 Contributing scenario controlling consumer exposure for: PC9a, Removers (paint-, glue-, wall paper-, sealant-remover)		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 3%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	491 g
Frequency and duration of use	Exposure duration	2 min
	Frequency of use	3 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,50 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	
2.16 Contributing scenario controlling consumer exposure for: PC9b, Fillers and putty		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	85 g
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Frequency and duration of use	Exposure duration	4 h
	Frequency of use	12 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.17 Contributing scenario controlling consumer exposure for: PC9b, Plasters and floor equalizers

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 0,3%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	6,9 kg
Frequency and duration of use	Exposure duration	0,5 h
	Frequency of use	2 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.18 Contributing scenario controlling consumer exposure for: PC9b, Modelling clay

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	1 g
		(swallowed)
Frequency and duration of use	Exposure duration	1 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 254,4 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.19 Contributing scenario controlling consumer exposure for: PC9c

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa

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Amount used	Amount used per event	1,35 g
Frequency and duration of use	Exposure duration	0,03 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 254,40 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.20 Contributing scenario controlling consumer exposure for: PC15, Waterborne latex wall paint

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Exposure duration	2,2 h
	Frequency of use	4 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.21 Contributing scenario controlling consumer exposure for: PC15, Solvent rich, high solid, water borne paint

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 2,2%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	744 g
Frequency and duration of use	Exposure duration	2,2 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.22 Contributing scenario controlling consumer exposure for: PC15, Aerosol spray can

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 21%
	Physical Form (at time of use)	liquid

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	Vapour pressure	> 10 Pa
Amount used	Amount used per event	491 g
Frequency and duration of use	Exposure duration	2 h
	Frequency of use	3 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,50 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.23 Contributing scenario controlling consumer exposure for: PC15, Removers (paint-, glue-, wall paper-, sealant remover)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 3,4%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	215 g
Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	2 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	

2.24 Contributing scenario controlling consumer exposure for: PC18

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	40 g
Frequency and duration of use	Exposure duration	2,2 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 71,40 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.25 Contributing scenario controlling consumer exposure for: PC23, Polishes, wax/cream (floor, furniture, shoes)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	liquid

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	Vapour pressure	> 10 Pa
Amount used	Amount used per event	56 g
Frequency and duration of use	Exposure duration	1,23 h
	Frequency of use	29 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.26 Contributing scenario controlling consumer exposure for: PC23, Polishes, spray (furniture, shoes)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 33%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	56 g
Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	8 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.27 Contributing scenario controlling consumer exposure for: PC24, Liquids

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 100%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	4 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	

2.28 Contributing scenario controlling consumer exposure for: PC24, Pastes

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 15%
	Physical Form (at time of use)	liquid

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	Vapour pressure	> 10 Pa
Amount used	Amount used per event	34 g
Frequency and duration of use	Exposure duration	6 h
	Frequency of use	10 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.29 Contributing scenario controlling consumer exposure for: PC24, Sprays

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 45%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	73 g
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.30 Contributing scenario controlling consumer exposure for: PC31, Polishes, wax / cream (floor, furniture, shoes)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	142 g
Frequency and duration of use	Exposure duration	1,23 h
	Frequency of use	29 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.31 Contributing scenario controlling consumer exposure for: PC31, Polishes, spray (furniture, shoes)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 48%
	Physical Form (at time of use)	liquid

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	use)	
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	8 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.32 Contributing scenario controlling consumer exposure for: PC34

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	115 g
Frequency and duration of use	Exposure duration	1 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.3c.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

Health

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.

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1. Short title of Exposure Scenario 12: Use in Cleaning Agents

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
	Maximum daily site tonnage (kg/day):	17000 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	100 %
	Emission or Release Factor: Water	0,003 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level	Air	Treat air emission to provide a typical removal

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(source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		efficiency of (%): (Efficiency: 70 %)
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Bulk transfers	Ensure material transfers are under containment or extract ventilation.(PROC8a, PROC8b)
	Automated process with (semi) closed systems Use in contained systems Drum/batch transfers	Handle substance within a closed system. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2)
	Automated process with (semi) closed systems Use in contained systems	Handle substance within a closed system.(PROC2)
	Application of cleaning products in closed systems	Handle substance within a closed system.(PROC2)
	Filling / preparation of	Provide extraction ventilation at points where

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	equipment from drums or containers Dedicated facility	emissions occur.(PROC8b)
	Use in contained batch processes Treatment by heating	Provide extraction ventilation at points where emissions occur.(PROC4)
	Degreasing small objects in cleaning station	Provide extraction ventilation at points where emissions occur.(PROC13)
	Cleaning with low-pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Cleaning with high pressure washers	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. or Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Avoid carrying out operation for more than 1 hour.(PROC7)
	Manual Surfaces cleaning No spraying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Avoid carrying out operation for more than 1 hour.(PROC10)
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 13: Use in Cleaning Agents

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Activity	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,4 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	2 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Soil	Do not apply industrial sludge to natural soils.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage with occasional controlled exposure	Store substance within a closed system. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2)
	Cleaning of medical devices	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC4)
	Filling / preparation of equipment from drums or containers Dedicated facility	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Automated process with (semi) closed systems Use in contained systems	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2)
	Automated process with (semi) closed systems Use in contained systems Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)

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	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC4)
	Filling / preparation of equipment from drums or containers Outdoor.	Use drum pumps or carefully pour from container.(PROC8a, PROC8b)
	Manual Surfaces cleaning Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Cleaning with low-pressure washers Rolling, Brushing No spraying	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Cleaning with high pressure washers Spraying Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC11)
	Cleaning with high pressure washers Spraying Outdoor.	Limit the substance content in the mixture to 5 %.(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc Rolling, Brushing	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extraction ventilation at points where emissions occur. Avoid carrying out operation for more than 1 hour.(PROC10, PROC11, PROC13)
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Avoid carrying out operation for more than 4 hours.(PROC8a, PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Manual Surfaces cleaning Dipping, immersion and	Wear a respirator conforming to EN140 with Type A filter or better.(PROC13)

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	pouring	
	Cleaning with low-pressure washers Rolling, Brushing No spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Cleaning with high pressure washers Spraying Indoor	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Cleaning with high pressure washers Spraying Outdoor.	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.4b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 14: Use in Cleaning Agents

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC3: Air care products PC4: Anti-freeze and de-icing products PC8: Biocidal products PC9a: Coatings and paints, thinners, paint removers PC24: Lubricants, greases, release products PC35: Washing and cleaning products (including solvent based products) PC38: Welding and soldering products (with flux coatings or flux cores), flux products
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,3 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	2,5 %
Conditions and measures related to sewage treatment plant	Emission or Release Factor: Soil	2,5 %
	Flow rate of sewage treatment plant effluent	2.000 m3/d
Conditions and measures related to external treatment of waste for disposal	Percentage removed from waste water	93,6 %
	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

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Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2.2 Contributing scenario controlling consumer exposure for: PC3, Aircare, instant action (aerosol sprays)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	0,1 g
Frequency and duration of use	Exposure duration	0,25 h
	Frequency of use	4 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.3 Contributing scenario controlling consumer exposure for: PC3, Aircare, continuous action (solid & liquid)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	0,48 g
Frequency and duration of use	Exposure duration	8 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,70 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.4 Contributing scenario controlling consumer exposure for: PC4, Washing car window

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Exposure duration	0,02 h
	Frequency of use	365 days/year

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Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	
2.5 Contributing scenario controlling consumer exposure for: PC4, Pouring into radiator		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	2 kg
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	
2.6 Contributing scenario controlling consumer exposure for: PC4, Lock de-icer		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	4 g
Frequency and duration of use	Exposure duration	0,25 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 214,4 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	
2.7 Contributing scenario controlling consumer exposure for: PC8, Laundry and dish washing products, PC35, Laundry and dish washing products		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	15 g
Frequency and duration of use	Exposure duration	0,5 h
	Frequency of use	365 days/year
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Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.8 Contributing scenario controlling consumer exposure for: PC8, Cleaners, liquids, PC35, Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	27 g
Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	128 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.9 Contributing scenario controlling consumer exposure for: PC8, Cleaners, trigger sprays, PC35, Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 17%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	128 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.10 Contributing scenario controlling consumer exposure for: PC9a, Removers (paint-, glue-, wall paper-, sealant-remover)

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 3%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa

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Amount used	Amount used per event	491 g
Frequency and duration of use	Exposure duration	2 h
	Frequency of use	3 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.11 Contributing scenario controlling consumer exposure for: PC24, Liquids

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	4 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
		Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.

2.12 Contributing scenario controlling consumer exposure for: PC24, Pastes

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 20%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	34 g
Frequency and duration of use	Exposure duration	8 h
	Frequency of use	10 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.13 Contributing scenario controlling consumer exposure for: PC24, Sprays

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	73 g

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Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.14 Contributing scenario controlling consumer exposure for: PC38

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 20%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	12 g
Frequency and duration of use	Exposure duration	1 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.4c.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management

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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.

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1. Short title of Exposure Scenario 15: Use as binders and release agents

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC6: Calendering operations PROC7: Industrial spraying PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing) and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC4

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
	Maximum daily site tonnage (kg/day):	17000 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	100 %
	Emission or Release Factor: Water	0,003 %
	Emission or Release Factor: Soil	0 %
Technical conditions and	Air	Treat air emissions to provide a typical removal (or

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measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		abatement) (Efficiency: 80 %)
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Exposure duration per day	< 1 h(PROC14)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Material transfers with occasional controlled exposure	Ensure material transfers are under containment or extract ventilation.(PROC8a, PROC8b, PROC9)
	Material transfers Batch process (closed systems)	Ensure material transfers are under containment or extract ventilation. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)
	Drum/batch transfers	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.(PROC8b)
	Mixing operations (closed systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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		Handle substance within a closed system.(PROC3)
	Mixing operations (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Article formation in mould	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC14)
	Casting operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC7)
	Spraying Machine	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC7)
	Manual Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Spraying Manual	Carry out in a vented booth or extracted enclosure. Avoid carrying out operation for more than 4 hours.(PROC7)
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 4.10a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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alone or in combination.

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 16: Use as binders and release agents

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC6: Calendering operations</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Activity	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,3 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	9,5 %
	Emission or Release Factor: Water	0,25 %
Technical conditions and measures at process level (source) to prevent release	Emission or Release Factor: Soil	0,25 %
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required

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Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m ³ /d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Material transfers (closed systems) with occasional controlled exposure	Ensure material transfers are under containment or extract ventilation. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system.(PROC2)
	Drum/batch transfers	Use drum pumps or carefully pour from container.(PROC8a, PROC8b)
	Mixing operations (closed systems)	Formulate in enclosed or ventilated mixing vessels. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)
	Mixing operations (open systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC4)
	Article formation in mould	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC14)

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	Casting operations (open systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC11)
	Spraying Manual	Minimise exposure by extracted full enclosure for the operation or equipment. Avoid carrying out operation for more than 15 minutes.(PROC11)
	Manual Rolling, Brushing	Provide extraction ventilation at points where emissions occur. Avoid carrying out operation for more than 1 hour.(PROC10)
	Storage	Store substance within a closed system.(PROC1)
	Storage with occasional controlled exposure	Store substance within a closed system. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2)
	Material transfers (closed systems)	Handle substance within a closed system.(PROC1)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Casting operations (open systems)	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Spraying Manual	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Manual Rolling, Brushing	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.10b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

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1. Short title of Exposure Scenario 17: Use in agrochemicals

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,3 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	90 %
	Emission or Release Factor: Water	1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.

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Organizational measures to prevent/limit release from the site	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Transfer from/pouring from containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b)
	Spraying (automatic/robotic)	Limit the substance content in the mixture to 25 %. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc	Limit the substance content in the mixture to 25 %. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC11, PROC13)
	Equipment cleaning and maintenance Non-dedicated facility	Avoid carrying out operation for more than 1 hour.(PROC8a)
	Disposal of wastes Non-dedicated facility Outdoor.	Drain or remove substance from equipment prior to break-in or maintenance. Avoid carrying out operation for more than 1 hour.(PROC8a)
	Storage	Store substance within a closed system.

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	with occasional controlled exposure	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2)
	Mixing in containers Outdoor.	Avoid carrying out operation for more than 1 hour.(PROC4)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Spraying/fogging by manual application Outdoor.	Wear a full face respirator conforming to EN136 with type A filter or better Avoid carrying out operation for more than 4 hours.(PROC11)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.11a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

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1. Short title of Exposure Scenario 18: Use in agrochemicals

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC12: Lawn and garden preparations, including fertilizers (- Fertilizers) PC27: Plant protection products
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the consumer use of agrochemicals in liquid and solid forms.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	27,3 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	90 %
	Emission or Release Factor: Water	1 %
Conditions and measures related to sewage treatment plant	Emission or Release Factor: Soil	9 %
	Flow rate of sewage treatment plant effluent	2.000 m ³ /d
Conditions and measures related to external treatment of waste for disposal	Percentage removed from waste water	93,6 %
	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling consumer exposure for: PC12, PC27

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 4,5%
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	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 Pa
Amount used	Amount used per event	0,3 g
Frequency and duration of use	Exposure duration	2 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.11b.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

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1. Short title of Exposure Scenario 19: Use as a fuel

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC7

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
	Maximum daily site tonnage (kg/day):	17000 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,5 %
	Emission or Release Factor: Water	0,001 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 95 %)
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage with occasional controlled exposure	Store substance within a closed system.(PROC2)
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a, PROC8b)
	Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)

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	General exposures (closed systems) with occasional controlled exposure	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 7.12a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 20: Use as a fuel

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	0,2 ton(s)/year
	Maximum daily site tonnage (kg/day):	0,55 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	0,001 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Sediment	Risk from environmental exposure is driven by

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prevent/limit release from the site		freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	10.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
	Exposure duration per day	< 1 h(PROC13)
	Exposure duration per day	< 4 h(PROC2)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Equipment cleaning and maintenance	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Storage	Store substance within a closed system.(PROC1, PROC2)
	Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Dipping, immersion and pouring	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)
	Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1

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		hour.(PROC8a, PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 9.12b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 21: Use as a fuel

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC13: Fuels
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Covers consumer uses in liquid fuels.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	0,2 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	0,001 %
Conditions and measures related to sewage treatment plant	Emission or Release Factor: Soil	0,001 %
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
Conditions and measures related to external treatment of waste for disposal	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
	Waste treatment	This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.

2.2 Contributing scenario controlling consumer exposure for: PC13, Liquid: Automotive Refuelling

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 38%
	Physical Form (at time of	liquid

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	use)	
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	37,5 kg
Frequency and duration of use	Exposure duration	0,05 h
	Frequency of use	52 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 210 cm ²
Other given operational conditions affecting consumers exposure	Room size	100 m ³
	Covers use at ambient temperatures.	
2.3 Contributing scenario controlling consumer exposure for: PC13, Liquid: Scooter Refuelling		
Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	3,75 kg
Frequency and duration of use	Exposure duration	0,03 h
	Frequency of use	52 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 210 cm ²
Other given operational conditions affecting consumers exposure	Room size	100 m ³
	Covers use at ambient temperatures.	
2.4 Contributing scenario controlling consumer exposure for: PC13, Liquid: Garden Equipment - Use		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	750 g
Frequency and duration of use	Exposure duration	0,03 h
	Frequency of use	26 days/year
Other given operational conditions affecting consumers exposure	Room size	100 m ³
		Covers use at ambient temperatures.
2.5 Contributing scenario controlling consumer exposure for: PC13, Liquid: Lamp oil		
Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	100 g
Frequency and duration of use	Exposure duration	0,01 h
	Frequency of use	52 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 210 cm ²
Other given operational conditions affecting consumers	Room size	20 m ³
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exposure

Covers use at ambient temperatures., Covers use under typical household ventilation.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 9.12c.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

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1. Short title of Exposure Scenario 22: Use as lubricants

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC1: Adhesives, sealants PC24: Lubricants, greases, release products PC31: Polishes and wax blends
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d, ERC9a, ERC9b

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	1 %
Conditions and measures related to sewage treatment plant	Emission or Release Factor: Soil	1 %
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling consumer exposure for: PC1, Glues, hobby use

Product characteristics	Concentration of the	Covers concentrations up to 30%
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	Substance in Mixture/Article	
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	9 g
Frequency and duration of use	Exposure duration	4 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.3 Contributing scenario controlling consumer exposure for: PC1, Glues DIY-use (carpet glue, tile glue, wood parquet glue)

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	3,195 kg
Frequency and duration of use	Exposure duration	6 h
	Frequency of use	1 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 11000 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.4 Contributing scenario controlling consumer exposure for: PC1, Glue from spray

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	85,05 g
Frequency and duration of use	Exposure duration	4 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
		Covers use at ambient temperatures., Covers use under typical household ventilation.

2.5 Contributing scenario controlling consumer exposure for: PC1, Sealants

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Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	75 g
Frequency and duration of use	Exposure duration	1 h
	Frequency of use	365 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.6 Contributing scenario controlling consumer exposure for: PC24, Liquids

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	4 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
Other given operational conditions affecting consumers exposure	Room size	34 m ³
	Covers use at ambient temperatures., Covers use in a one car garage (34 m ³) under typical ventilation.	

2.7 Contributing scenario controlling consumer exposure for: PC24, Pastes

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 20%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	34 g
Frequency and duration of use	Frequency of use	10 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m ³
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.8 Contributing scenario controlling consumer exposure for: PC24, Sprays

Product characteristics	Concentration of the Substance in	Covers concentrations up to 8%
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	Mixture/Article	
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	73 g
Frequency and duration of use	Exposure duration	0,17 h
	Frequency of use	6 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.9 Contributing scenario controlling consumer exposure for: PC31, Polishes, wax / cream (floor, furniture, shoes)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	142 g
Frequency and duration of use	Exposure duration	1,23 h
	Frequency of use	29 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

2.10 Contributing scenario controlling consumer exposure for: PC31, Polishes, spray (furniture, shoes)

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration	0,33 h
	Frequency of use	8 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm ²
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures., Covers use under typical household ventilation.	

3. Exposure estimation and reference to its source

Environment

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Used EUSES model., ESVOC spERC 9.6d.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

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

Health

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.

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1. Short title of Exposure Scenario 23: Use as lubricants

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC17: Lubrication at high energy conditions and in partly open process</p>
Environmental Release Categories	<p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC7: Industrial use of substances in closed systems</p>
Activity	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7

No exposure assessment presented for the environment.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	5000 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,5 %
	Emission or Release Factor: Water	0,03 %
	Emission or Release Factor: Soil	0,1 %

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Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 70 %)
	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers Dedicated facility	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Use drum pumps or carefully pour from container.(PROC8a)
	Filling / preparation of equipment from drums or containers Dedicated facility	Use drum pumps or carefully pour from container. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Initial factory fill of equipment	Ensure material transfers are under containment or extract ventilation.(PROC9)
	Operation and lubrication of high energy open equipment Indoor	Restrict area of openings to equipment. Provide extract ventilation to points where emissions occur.(PROC17)

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	Operation and lubrication of high energy open equipment Outdoor.	Restrict area of openings to equipment. Provide extract ventilation to points where emissions occur.(PROC17)
	Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC7)
	Maintenance (of larger plant items) and machine set up	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Maintenance of small items	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a)
	Remanufacture of reject articles	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC9)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
	General exposures (closed systems) Batch process	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC3)
	General exposures (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.
ESVOC spERC 4.6a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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combination.

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 24: Use as lubricants

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC17: Lubrication at high energy conditions and in partly open process</p> <p>PROC18: Greasing at high energy conditions</p> <p>PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p> <p>ERC9a: Wide dispersive indoor use of substances in closed systems</p> <p>ERC9b: Wide dispersive outdoor use of substances in closed systems</p>
Activity	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d, ERC9a, ERC9b

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	5000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	10 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	1 %

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	Emission or Release Factor: Soil	1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers Dedicated facility	Transfer via enclosed lines.(PROC8b)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Use drum pumps.(PROC8a)
	Filling / preparation of equipment from drums or containers Dedicated facility	Transfer via enclosed lines.(PROC8b)
	Operation and lubrication of high energy open equipment Indoor	Restrict area of openings to equipment. Provide extract ventilation to points where emissions occur. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or

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		Limit the substance content in the mixture to 5 %. Provide a good standard of controlled ventilation (10 to 15 air changes per hour).(PROC17)
	Operation and lubrication of high energy open equipment Outdoor.	Limit the substance content in the mixture to 5 %. Avoid carrying out operation for more than 4 hours.(PROC17)
	Maintenance (of larger plant items) and machine set up Dedicated facility	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Maintenance of small items	Drain down system prior to equipment opening or maintenance. Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Avoid carrying out operation for more than 4 hours.(PROC8a)
	Engine lubricant service	Transfer via enclosed lines. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
	General exposures (closed systems)	Handle substance within a closed system. or provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC1)
	General exposures (closed systems) Batch process	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)
	General exposures (open systems)	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Maintenance (of larger plant items) and machine set up Batch process	Provide extract ventilation to emission points when contact with warm (>50oC) product is likely. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b)
	Batch process	Handle substance within a closed system.(PROC3)
Conditions and measures related to personal protection, hygiene and health evaluation	Engine lubricant service	Wear suitable gloves tested to EN374.(PROC9)

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.4b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 25: Use as Functional Fluids

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC16: Heat transfer fluids PC17: Hydraulic fluids
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Use of sealed items containing functional fluids e.g. transfer oils, hydraulic fluids, refrigerants.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	0,2 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	5 %
	Emission or Release Factor: Water	2,5 %
Conditions and measures related to sewage treatment plant	Emission or Release Factor: Soil	2,5 %
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
Conditions and measures related to external treatment of waste for disposal	Sludge Treatment	Do not apply industrial sludge to natural soils.
	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling consumer exposure for: PC16, PC17

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
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	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Exposure duration	0,17 min
	Frequency of use	4 days/year
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm ²
	Other given operational conditions affecting consumers exposure	Room size 34 m ³ Covers use in a one car garage (34 m ³) under typical ventilation.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 9.13c.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

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1. Short title of Exposure Scenario 26: Use as Functional Fluids

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.

2.1 Contributing scenario controlling environmental exposure for: ERC7

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	100 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,5 %
	Emission or Release Factor: Water	0,03 %
	Emission or Release Factor: Soil	0,1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 80 %)
	Water	Prevent discharge of substance to wastewater or

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	During manufacturing no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Bulk transfers Batch process	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC4)
	Drum/batch transfers	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC8a, PROC8b)
	Pelletising (closed systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC4)
	Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container.(PROC8a, PROC8b)
	General exposures (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Provide extract ventilation to points where emissions occur.(PROC4)

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	Remanufacture of reject articles	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Provide extract ventilation to points where emissions occur.(PROC9)
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3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 7.13a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 27: Use as Functional Fluids

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

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	0,2 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	5 %
	Emission or Release Factor: Water	2,5 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	

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Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC20

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Equipment maintenance Non-dedicated facility	Drain or remove substance from equipment prior to break-in or maintenance. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC8a)
	Drum/batch transfers Non-dedicated facility	Use drum pumps or carefully pour from container. Avoid carrying out operation for more than 4 hours.(PROC8a)
	Transfer from/pouring from containers	Use drum pumps or carefully pour from container. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC8a)
	General exposures (open systems) Elevated temperature	Provide extract ventilation to points where emissions occur.(PROC3)
	Remanufacture of reject articles	Drain or remove substance from equipment prior to break-in or maintenance. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC20)
	Storage with occasional controlled exposure	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) or Ensure operation is undertaken outdoors.(PROC2)

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

Used EUSES model., ESVOC spERC 9.13b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 28: Use in laboratories

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	100 ton(s)/year
	Maximum daily site tonnage (kg/day):	333 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	2,5 %
	Emission or Release Factor: Water	2 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils. Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d

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	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	cleaning Rolling, Brushing Vessel and container cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 29: Use in laboratories

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems
Activity	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC8a

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	0,2 ton(s)/year
	Maximum daily site tonnage (kg/day):	7,4 kg/day
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	50 %
	Emission or Release Factor: Water	50 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d

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	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	cleaning Rolling, Brushing Vessel and container cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Handle in a fume cupboard or under extract ventilation.(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model., ESVOC spERC 8.17.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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Environment

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

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 30: Use in road and construction applications

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Activity	Application of surface coatings and binders in road and construction activities, including paving uses, manual mastic and in the application of roofing and water-proofing membranes.

2.1 Contributing scenario controlling environmental exposure for: ERC8d, ERC8f

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	0,2 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Prevent discharge of substance to wastewater or recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	

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Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers Non-dedicated facility	Use drum pumps or carefully pour from container. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC8a)
	Drum/batch transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC8b)
	Rolling, Brushing Indoor	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Spraying/fogging by machine application (closed systems) Outdoor.	Provide extract ventilation to points where emissions occur.(PROC11)
	Dipping, immersion and pouring Indoor	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Provide extract ventilation to points where emissions occur.(PROC8a, PROC8b)
	Storage with occasional controlled exposure	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC2)

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Organisational measures to prevent /limit releases, dispersion and exposure	Equipment cleaning and maintenance	Operate activity away from sources of substance emission or release.(PROC8a, PROC8b)
	Spraying/fogging by machine application (closed systems) Indoor	Operate activity away from sources of substance emission or release.(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	Dipping, immersion and pouring Outdoor.	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC13)
	Rolling, Brushing Outdoor.	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC10)
	Spraying/fogging by machine application (closed systems) Indoor	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 31: Use in Oil and Gas field drilling and production operations

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4

No exposure assessment presented for the environment.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Pouring from small containers	Use drum pumps or carefully pour from container.(PROC8a, PROC8b)
	Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Filling / preparation of equipment from drums or containers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.

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		Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Drill floor operations	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC4)
	Operation of solids filtering equipment	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC4)
	Treatment and disposal of filtered solids	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC3)
	Process sampling	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC8b)
	General exposures (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC4)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment., Qualitative approach used to conclude safe use.

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

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Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 32: Use in Oil and Gas field drilling and production operations

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC8d

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
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	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Equipment cleaning and maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Bulk transfers	Transfer via enclosed lines.(PROC8a, PROC8b)
	Filling / preparation of equipment from drums or containers	Transfer via enclosed lines.(PROC8a, PROC8b)
	Drill floor operations	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC4)
	Operation of solids filtering equipment - vapour exposures	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC4)
	Operation of solids filtering equipment	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Avoid carrying out operation for more than 1 hour.(PROC4)
	Treatment and disposal of filtered solids Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)
	Process sampling Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8b)
	Pouring from small containers Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Use drum pumps or carefully pour from container.(PROC8a, PROC8b)
	General exposures (open systems) Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC4)
Batch process with occasional controlled exposure Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)	

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Workers

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The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 33: Use as mining chemicals

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use of the substance in extraction processes at mining operations, including material transfers, winning and separation activities, and substance recovery and disposal.

2.1 Contributing scenario controlling environmental exposure for: ERC4

No exposure assessment presented for the environment.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	100 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	25 %
	Emission or Release Factor: Water	50 %
	Emission or Release Factor: Soil	5 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 80 %)
	Water	Prevent discharge of substance to wastewater or

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discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		recover from wastewater
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8b, PROC9

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Equipment cleaning and maintenance Non-dedicated facility Outdoor.	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Avoid carrying out operation for more than 1 hour.(PROC2)
	Drum/batch transfers	Use drum pumps.(PROC8b)
	Pouring from small containers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC9)
	General exposures (closed systems) Batch process Outdoor.	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	General exposures (open systems)	Provide extract ventilation to points where emissions occur.(PROC4)
	phase separation (closed systems) Outdoor.	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC4)
	Process sampling	Provide a good standard of controlled ventilation

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Batch process
(closed systems)
Outdoor.

(10 to 15 air changes per hour)(PROC3, PROC8b)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

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

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 34: Explosives manufacture & use

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations
Activity	Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC2

Substance is isomeric mixture, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	100 ton(s)/year
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,05 %
	Emission or Release Factor: Water	0,03 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Emission or Release Factor: Soil	0,01 %
	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 80 %)
	Water	Prevent discharge of substance to wastewater or recover from wastewater

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Organizational measures to prevent/limit release from the site	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,6 %
	Sludge Treatment	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 Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.(PROC8a, PROC8b)
	Bulk transfers Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Drum/batch transfers Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a, PROC8b)
	Mixing in containers (closed systems) Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Mixing in containers (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 4 hours.(PROC4)
	Transfer from/pouring from containers	Use drum pumps. provide a good standard of general ventilation (not

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	Non-dedicated facility Outdoor.	less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC8a)
	Storage	Ensure operation is undertaken outdoors.(PROC2)
	cleaning Maintenance of small items Outdoor.	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Avoid carrying out operation for more than 1 hour.(PROC2)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.
ESVOC spERC 2.2.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated., Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

Environment

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

Health

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.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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QUALITY SYSTEMS		
ISO 9001	Yes	Yes
ISO 14001	Yes	Yes
ISO 22000	Yes	Yes
FSSC 22000	Yes	Yes
GMP+ -feed	Yes	Yes
OHSAS18001	-	Yes
ESAD	Yes	Yes
other	-	AEO