METHYL ISOBUTYL KETONE

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In case of emergency:
Belgium:
Antipoison Center - Brussels :
TEL: 070/245.245

The Netherlands:
National Poisoning Information Center - Bilthoven :
TEL: 030/274.88.88 (Information only for professionals in case of acute intoxications)

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

1.1. Product identifier

Chemical description	: 4-Methyl-2-pentanone , Methyl isobutyl ketone , Isopropyl aceton , Hexanone .
Type of product	: Pure product .
Reach registration number	: 01-2119473980-30

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	: See heading of Material Safety Data Sheet.

1.4. Emergency telephone number

Emergency phone number	: See heading of Material Safety Data Sheet.

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC

Highly flammable (F; R11)
Harmful (Xn; R20)
Irritant (Xi; R36/37)
Other (R66)

Classification according to Regulation (EC) No 1272/2008

Flammable liquids - Category 2 - Danger (Flam. Liq. 2; H225)
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 SE3; H335)

2.2. Label elements

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

• Dangerous ingredient(s)	: 4-Methyl-2-pentanone
• Hazard pictogram(s)	
• Signal word	: Danger
• Hazard statements	: H225 - Highly flammable liquid and vapour. H319 - Causes serious eye irritation. H332 - Harmful if inhaled. H335 - May cause respiratory irritation. EUH066 - Repeated exposure may cause skin dryness or cracking.

SECTION 2. Hazards identification (continued)

• Precautionary statements

- Prevention : P210 - Keep away from heat, sparks, open flames or hot surfaces. – No smoking. P243 - Take precautionary measures against static discharge. P261 - Avoid breathing dust, fume, gas, mist, vapours, spray.
- Response : P304+P340 - IF INHALED : Remove to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Storage : P403+P233 - Store in well-ventilated place. Keep container tightly closed.

2.3. Other hazards

* Physical/chemical hazards : May generate static electric discharges.

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.

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 : Vapour may form explosive mixture with air.

SECTION 3. Composition/information on ingredients

3.1. Substances

Name component(s)		Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
4-Methyl-2-pentanone	:	> 99 %	108-10-1	203-550-1	606-004-00-4	01-2119473980-30	F; R11 Xn; R20 R66 Xi; R36/37 ---------- Flam. Liq. 2; H225 Eye Irrit. 2; H319 Acute Tox. 4 (inhal); H332 STOT SE 3; H335

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

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.
If not breathing, give artificial respiration.
Get immediate medical advice/attention.
- Skin Contact : Remove contaminated clothing.
Rinse skin immediately with plenty of water. (shower if necessary).
Consult doctor if irritation develops.

* - Eye Contact : Rinse immediately thoroughly and long (at least 15 min.) with plenty of water.
Remove contact lenses.
Consult eye doctor.
Keep rinsing or dripping the eye during transport.

SECTION 4. First aid measures (continued)

- Ingestion : DO NOT INDUCE VOMITING. Rinse mouth with water.
  Seek medical attention IMMEDIATELY or take to 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 , Sand .
- Insuitable : 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.

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 and eliminate as hazardous waste. (See section 13)
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

SECTION 7. Handling and storage (continued)

* Handling : 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.
Emergency eye wash fountains and showers should be available in the immediate vicinity of any potential exposure.
Before distillation: check if peroxides exist.

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 , Strong bases .

* Protection against Fire and Explosion : Remove all sources 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.
Vapours are heavier than air and spread along the ground.
Take measures against electrostatic discharges.
Do not use compressed air to either agitate or transfer contents of storage containers (tanks) / shipping drums containing this material.
Always use explosionproof electrical equipment.

Packaging Material : Steel , Stainless steel .

Insuitable Packaging Material : Aluminium , Several synthetics , Natural rubber , Neoprene , Butyl rubber .

7.3. Specific end use(s)

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

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits : 4-Methyl-2-pentanone : Limit value (BE) : 20 ppm (83 mg/m³) (2011)
4-Methyl-2-pentanone : Short time value (BE) : 50 ppm (208 mg/m³) (2011)
4-Methyl-2-pentanone : Limit value (TWA 8 h) (NL) : 25 ppm (104 mg/m³) (2008)
4-Methyl-2-pentanone : Limit value (TWA 15 min) (NL) : 50 ppm (208 mg/m³) (2008)

Biological limit values : They will be included when available.

DNELs :
- 4-Methyl-2-pentanone : Worker, acute - local effects, inhalation : 208 mg/m³
- 4-Methyl-2-pentanone : Worker, acute - systemic effects, inhalation : 208 mg/m³
- 4-Methyl-2-pentanone : Worker, long-term - systemic effects, inhalation : 83 mg/m³
- 4-Methyl-2-pentanone : Worker, long-term - systemic effects, dermal : 11,8 mg/kg bw/ day
- 4-Methyl-2-pentanone : Worker, long-term - systemic effects, dermal : 83 mg/m³
- 4-Methyl-2-pentanone : Consumer, acute - local effects, inhalation : 155,2 mg/m³
- 4-Methyl-2-pentanone : Consumer, acute - systemic effects, inhalation : 155,2 mg/m³
- 4-Methyl-2-pentanone : Consumer, long-term - local effects, inhalation : 14,7 mg/m³
- 4-Methyl-2-pentanone : Consumer, long-term - systemic effects, inhalation : 14,7 mg/m³
- 4-Methyl-2-pentanone : Consumer, long-term - systemic effects, dermal : 4,2 mg/kg bw/ day
- 4-Methyl-2-pentanone : Consumer, long-term - systemic effects, oral : 4,2 mg/kg bw/ day

SECTION 8. Exposure controls/personal protection (continued)

PNECs : • 4-Methyl-2-pentanone : Fresh water : 0,6 mg/l
• 4-Methyl-2-pentanone : Marine water : 0,06 mg/l
• 4-Methyl-2-pentanone : Fresh water sediment : 8,27 mg/kg
• 4-Methyl-2-pentanone : Soil : 1,3 mg/kg
• 4-Methyl-2-pentanone : Sewage treatment plant : 27,5 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 .
- Hand protection : Suitable material for safety gloves (EN 374):
  Butyl rubber : penetration time 240' - thickness 0,7 mm
- Eye/Face protection : Closed safety glasses or face shield.

Environmental exposure controls : See sections 6, 7, 12 en 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	: Camphor smell .
*	Odour threshold	: 0,68 ppm
*	pH value	: 6-7
	Melting/Freezing point	: -84 °C
	Boiling Point/Range (1013 hPa)	: 116 °C
	Flash point	: 14 °C
	Fire hazard	: P1
	Evaporation rate	: 5,6 (Ether = 1) 1,6 (Butyl acetate = 1)
	Explosion limits in air	: 1,2 - 8 vol.%
	Vapour pressure (20°C)	: 2 kPa
*	Vapour pressure (50°C)	: 9,1 kPa
	Relative vapour density (air=1)	: 3,5
	Relative density (water=1)	: 0,8
	Density (20°C)	: 0,7978 g/cm³
	Solubility in water	: 1,4 g/100 ml
	Soluble in	: Chloroform .
	Miscible with	: Ethanol , Diethyl ether , Acetone , Benzene .
	Log P Octanol/Water (20°C)	: 1,11 - 1,51
	Auto-ignition temperature	: 460 °C
	Minimum ignition energy	: No data available.
	Decomposition temperature	: 448 °C
	Viscosity (20°C)	: 0,585 mPa.s (Dynamic) 0,73 mm³/s (Kinematic)
	Explosive properties	: Not explosive.
	Oxidizing properties	: No data available.

SECTION 9. Physical and chemical properties (continued)

9.2. Other information

Surface tension (20°C)	: 0,025 N/m
Specific leading	: 3*10E7 pS/m
% Volatiles (by weight)	: > 99
Critical pressure	: 3272 kPa
Critical temperature	: 298 °C
Saturation concentration	: 82 g/m³

SECTION 10. Stability and reactivity

10.1. Reactivity

Reactivity : Reacts violently with oxidizing agents, strong acids and strong lyes.

10.2. Chemical stability

Stability : Stable at normal circumstances .

10.3. Possibility of hazardous reactions

Hazardous reactions : If exposed to air : May form peroxides.

10.4. Conditions to avoid

Conditions to avoid : High temperatures .

10.5. Incompatible materials

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

10.6. Hazardous decomposition products

* Hazardous Decomposition Products : Carbon oxides .

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

* - Inhalation : Harmful if inhaled.
The product may cause central nervous system depression resulting in diminuation of consciousness.
Overexposure may cause: Stomachache , Intestinal complaints .
Product may affect kidney and liver.
Symptoms include: Vomiting , Cough , Headache , Drowsiness , Dizziness , Unconsciousness .
• 4-Methyl-2-pentanone : LC50 (Rat, inhalation, 4 h) : 8,2 - 16,4 mg/l

- Skin contact : Product degreases skin.
Symptoms include: Dry skin , Rough skin .
• 4-Methyl-2-pentanone : LD50 (Rabbit, dermal) : > 2000 mg/kg

- Ingestion : After swallowing, some drops of liquid can enter the longs (aspiration), which may cause pneumonia.
Symptoms include: Abdominal cramps , See "Inhalation" .
• 4-Methyl-2-pentanone : LD50 (Rat, oral) : 2080 mg/kg

* Skin corrosion/irritation : Repeated exposure may cause skin dryness or cracking.

* Serious eye damage/irritation : Causes serious eye irritation.

* Aspiration hazard : Symptoms of lungoedema mostly reveal after a few hours, intensified by physical effort.

SECTION 11. Toxicological information (continued)

Respiratory or skin sensitisation	: Not sensitive .
Carcinogenicity	: Not listed as carcinogenic . To human : Probably not carcinogenic . For animals : There are indications that the product is carcinogenic. By male rats : Effects on kidneys. These effects are considered being specific for the animal species and aren't relevant for the human being.
Mutagenicity	: Not listed as mutagenic .
Reproductive toxicity	: Not listed for reproductive toxicity .
Specific target organ toxicity - single exposure	: To human : Respiratory tract irritation .
Specific target organ toxicity - repeated exposure	: To human : Repeated exposure may cause skin dryness or cracking.

SECTION 12. Ecological information

12.1. Toxicity

Ecotoxicity : • 4-Methyl-2-pentanone : EC50 (Algae, 96 h) : 400 mg/l
• 4-Methyl-2-pentanone : LC50 (Fish, 96 h) : > 179 mg/l (Danio rerio)
• 4-Methyl-2-pentanone : EC50 (Daphnia magna, 48 h) : > 200 mg/l

12.2. Persistence and degradability

Persistence and degradability : • 4-Methyl-2-pentanone : Persistence and degradability : Easily biodegradable .

12.3. Bioaccumulative potential

Bioaccumulation : • 4-Methyl-2-pentanone : Bioaccumulation : Little chance on bioaccumulation .

12.4. Mobility in soil

Mobility : • 4-Methyl-2-pentanone : Mobility : Badly soluble in water.

12.5. Results of PBT and vPvB assessment

Evaluation : • 4-Methyl-2-pentanone : PBT/vPvB : No

12.6. Other adverse effects

WGK class (DE)	: 1 (Weak water pollutant).
Water damaging (NL)	: 11
Decontamination exertion (NL)	: B
Photochemical ozone creation potential	: No data available.
Ozone depletion potential	: None .
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.

SECTION 13. Disposal considerations (continued)

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 : 1245

14.2. UN proper shipping name

ADR Name : UN 1245 Methyl isobutyl ketone, 3, II, (D/E)
ADN Name : UN 1245 Methyl isobutyl ketone , 3, II
IMDG Name : UN 1245 Methyl isobutyl ketone , 3, II, (14°C)
* IATA Name : UN 1245 Methyl isobutyl ketone, 3, II

14.3. Transport hazard classe(s)

Class : 3

14.4. Packing group

Packaging Group : II

14.5. Environmental hazards

Environmentally hazard : No
Marine pollutant : No

14.6. Special precautions for user

Danger number : 33
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 : No data available.
Pollution category : No data available.

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° : 2-3-1

Relevant EU Rule(s) : 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

SECTION 15. Regulatory information (continued)

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 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 substance(s) that make up this material or for the material itself.

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 2 , Section 4 , Section 7 , Section 9 , Section 10 , Section 11 , Section 14 , Section 16 .
	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: http://apps.echa.europa.eu/registered/registered-sub.aspx#search
	R-phrase(s)	: R11 - Highly flammable. R20 - Harmful by inhalation. R36/37 - Irritating to eyes and respiratory system. R66 - Repeated exposure may cause skin dryness or cracking.
	(EU)H-statement(s)	: H225 - Highly flammable liquid and vapour. H319 - Causes serious eye irritation. H332 - Harmful if inhaled. H335 - May cause respiratory irritation. EUH066 - Repeated exposure may cause skin dryness or cracking.
*	List of abbrevations 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 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

SECTION 16. Other information (continued)

REACH : Registration, Evaluation, Authorisation and restriction of Chemicals
TWA (Time-Weighted Average) : the average exposure over a specified period
vPvB : very persistent and very bioaccumulative
WGK (Wassergefahrdungsklasse) : a German classification of substances that indicate the environmental hazard for surface water

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

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	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	1	NA	ES2150
2	Use as an intermediate	3	NA	NA	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES2154
3	Distribution of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	2	NA	ES2160
4	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES2156
5	Rubber production and processing	3	NA	NA	1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 13, 14, 15, 21	4	NA	ES2179
6	Polymer processing	3	NA	NA	1, 2, 3, 4, 5, 6, 8a, 8b, 9, 13, 14, 21	4	NA	ES2187
7	Polymer processing	22	NA	NA	1, 2, 6, 8a, 8b, 14, 21	8a	NA	ES2323
8	Uses in coatings	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	4	NA	ES2163
9	Uses in coatings	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a	NA	ES2195
10	Uses in coatings	21	NA	1, 4, 8, 9a, 9b, 9c, 15, 18, 23, 24, 31, 34	NA	8a, 8c, 8d, 8f	NA	ES2326
11	Use in Cleaning Agents	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES2165
12	Use in Cleaning Agents	22	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	8a	NA	ES2198
13	Use in Cleaning Agents	21	NA	3, 4, 8, 9a, 9b, 9c, 24, 35, 38	NA	8a, 8d	NA	ES2375

14	Use in agrochemicals	22	NA	NA	1, 2, 4, 8a, 8b, 11, 13	8a	NA	ES2240
15	Use in agrochemicals	21	NA	12, 27	NA	8a, 8d	NA	ES2362
16	Use as lubricants	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18	4	NA	ES2169
17	Use as lubricants	22	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	8a	NA	ES2212
18	Use as Functional Fluids	3	NA	NA	1, 2, 4, 8a, 8b, 9	7	NA	ES2176
19	Use as Functional Fluids	22	NA	NA	1, 2, 3, 8a, 9, 20	9a	NA	ES2243
20	Use in laboratories	3	NA	NA	10, 15	4	NA	ES2180
21	Use in laboratories	22	NA	NA	10, 15	8a	NA	ES2245
22	Use in metal working fluids / rolling oils	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17	4	NA	ES2172
23	Use in metal working fluids / rolling oils	22	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 11, 13, 17	8a	NA	ES2234
24	Use as water treatment chemicals	3	NA	NA	1, 2, 3, 4, 8a, 8b, 13	4	NA	ES2192
25	Use in Oil and Gas field drilling and production operations	3	NA	NA	1, 2, 3, 4, 8a, 8b	4	NA	ES2167
26	Other consumer uses	21	NA	28, 39	NA	8a, 8d	NA	ES2365

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	
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	ERC1: Manufacture of substances	

2.1 Contributing scenario controlling environmental exposure for: ERC1
As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Outdoor use.(PROC4)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	General exposures (open systems) Batch process	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Process sampling	Ensure samples are obtained under containment or extract ventilation.(PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling.(PROC8b)

	Bulk transfers (open systems)	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8b)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Workers

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

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
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.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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)

2.1 Contributing scenario controlling environmental exposure for: ERC6a		
Amount used	Annual amount per site	3003 ton(s)/year
	Daily amount per site	10,1 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	2,02 kg/day
	Emission or Release Factor: Water	101 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2,

		PROC4, PROC8b)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Outdoor use.(PROC4)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	General exposures (open systems) Batch process	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Process sampling	Ensure samples are obtained under containment or extract ventilation.(PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling.(PROC8b)
	Bulk transfers (open systems)	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8b)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	---	Fresh water	PEC	0,59mg/L	0,983
ERC6a	---	Fresh water sediment	PEC	8,13mg/kg dwt	0,983
ERC6a	---	Marine water	PEC	8,13mg/kg dwt	0,983
ERC6a	---	Marine sediment	PEC	0,813mg/kg	0,98

				dwt	
ERC6a	---	Sewage treatment plant (STP)	PEC	5,89mg/L	0,214
ERC6a	---	Agricultural soil	PEC	1,3mg/kg dwt	1

ESVOC spERC 6.1a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	0,042mg/m³	0,000506
PROC1	---	Worker - dermal, long-term - systemic	0,343mg/kg bw/day	0,029
PROC2	Indoor use.	Worker - inhalative, long-term	41,73mg/m³	0,503
PROC2	Indoor use.	Worker - dermal, long-term - systemic	1,371mg/kg bw/day	0,116
PROC2	Indoor use., with local exhaust ventilation	Worker - inhalative, long-term	4,173mg/m³	0,05
PROC2	Indoor use., with local exhaust ventilation	Worker - dermal, long-term - systemic	0,137mg/kg bw/day	0,012
PROC2	Outdoor use.	Worker - inhalative, long-term	29,21mg/m³	0,352
PROC2	Outdoor use.	Worker - dermal, long-term - systemic	1,371mg/kg bw/day	0,116
PROC3	Indoor use., with local exhaust ventilation	Worker - inhalative, long-term	10,43mg/m³	0,126
PROC3	Indoor use., with local exhaust ventilation	Worker - dermal, long-term - systemic	0,034mg/kg bw/day	0,003
PROC3	Outdoor use.	Worker - inhalative, long-term	73,03mg/m³	0,88
PROC3	Outdoor use.	Worker - dermal, long-term - systemic	0,343mg/kg bw/day	0,029
PROC4	Indoor use., with local exhaust ventilation	Worker - inhalative, long-term	8,347mg/m³	0,101
PROC4	Indoor use., with local exhaust ventilation	Worker - dermal, long-term - systemic	0,686mg/kg bw/day	0,058
PROC4	Outdoor use.	Worker - inhalative, long-term	58,43mg/m³	0,704
PROC4	Outdoor use.	Worker - dermal, long-term - systemic	1,371mg/kg bw/day	0,116

PROC8a	Indoor use., with local exhaust ventilation	Worker - inhalative, long-term	20,87mg/m³	0,251
PROC8a	Indoor use., with local exhaust ventilation	Worker - dermal, long-term - systemic	0,137mg/kg bw/day	0,012
PROC8b	Indoor use., with local exhaust ventilation	Worker - inhalative, long-term	6,26mg/m³	0,075
PROC8b	Indoor use., with local exhaust ventilation	Worker - dermal, long-term - systemic	0,686mg/kg bw/day	0,058
PROC15	Indoor use.	Worker - inhalative, long-term	41,73mg/m³	0,503
PROC15	Indoor use.	Worker - dermal, long-term - systemic	0,343mg/kg bw/day	0,029

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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	ERC2: Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2		
Amount used	Annual amount per site	12600 ton(s)/year
	Daily amount per site	42 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	4,2 kg/day
	Emission or Release Factor: Water	0,42 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

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	26,4 hPa

Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(PROC3)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC8b, PROC9)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Outdoor use.(PROC8b)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2)
	General exposures (closed systems) Batch process	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC3)
	General exposures (open systems) Batch process	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Process sampling	Avoid dip sampling.(PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling.(PROC8b)
	Bulk transfers (open systems)	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8b)
	Drum and small package filling	Clear spills immediately. Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC9)
	Equipment cleaning and maintenance	Apply vessel entry procedures including use of supplied compressed air. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Drain down and flush system prior to equipment opening or maintenance.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	PEC	0,003mg/L	0,005
ERC2	---	Fresh water sediment	PEC	0,043mg/kg dwt	0,005
ERC2	---	Marine water	PEC	0,000302mg/kg dwt	0,005
ERC2	---	Marine sediment	PEC	0,004mg/kg dwt	0,005
ERC2	---	Sewage treatment plant (STP)	PEC	0,024mg/L	0,001
ERC2	---	Agricultural soil	PEC	0,006mg/kg dwt	0,004

ESVOC spERC 1.1b.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC1	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC2, PROC8a	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC2, PROC8a	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC3	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC8b	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5

PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC15	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - dermal, long-term - systemic	---	< 0,1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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	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) 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) PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2		
Amount used	Annual amount per site	5985 ton(s)/year
	Daily amount per site	19,95 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	498,75 kg/day
	Emission or Release Factor: Water	99,75 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC14)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2)
	General exposures (closed systems)	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC3)
	General exposures (open systems) Batch process	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC4)
	Batch processes at elevated temperatures	Formulate in enclosed or ventilated mixing vessels. Ensure material transfers are under containment or extract ventilation.(PROC3)
	Process sampling	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC3)
	Bulk transfers	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8b)
	Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC5)
	Transfer from/pouring from containers Manual	Provide extract ventilation to points where emissions occur. Use drum pumps or carefully pour from container.(PROC8a)
	Drum/batch transfers	Provide extract ventilation to points where emissions occur. Use drum pumps or carefully pour from container.(PROC8b)
	Production of preparations or articles by tabletting, compression, extrusion, pelettisation	Handle substance within a predominantly closed system provided with extract ventilation. (Efficiency: 90 %)(PROC14)
	Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation. Clear spills immediately.(PROC9)

	Equipment cleaning and maintenance	Apply vessel entry procedures including use of supplied compressed air. Drain down and flush system prior to equipment opening or maintenance. Transfer via enclosed lines.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Mixing operations (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC5)
	Transfer from/pouring from containers Manual	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Equipment cleaning and maintenance	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	PEC	0,583mg/L	0,972
ERC2	---	Fresh water sediment	PEC	8,03mg/kg dwt	0,971
ERC2	---	Marine water	PEC	0,058mg/kg dwt	0,972
ERC2	---	Marine sediment	PEC	0,803mg/kg dwt	0,967
ERC2	---	Sewage treatment plant (STP)	PEC	5,82mg/L	0,212
ERC2	---	Agricultural soil	PEC	1,3mg/kg dwt	1

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

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC1	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC2, PROC5, PROC8a,	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5

PROC14				
PROC2, PROC5, PROC8a, PROC14	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC3	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8b, PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b, PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC15	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - dermal, long-term - systemic	---	< 0,1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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	
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) PROC6: Calendering operations 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent PROC21: Low energy manipulation of substances bound in materials and/or articles	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	100 ton(s)/year
	Daily amount per site	5 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	5000 kg/day
	Emission or Release Factor: Water	50 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC21		
Product characteristics	Concentration of the	Covers percentage substance in the product up to

	Substance in Mixture/Article	100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13, PROC14)
	Exposed skin areas	Two hands 960 cm² (PROC6, PROC8a)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC7)
	Exposed skin areas	Hands and forearms. 1980 cm² (PROC21)
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	Material transfers	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC8b, PROC9)
	Small scale weighing	Ensure material transfers are under containment or extract ventilation.(PROC3, PROC4, PROC9)
	Additive premixing	Ensure material transfers are under containment or extract ventilation.(PROC5)
	Calendering (including Banburys)	Minimise exposure by extracted full enclosure for the operation or equipment. Provide enhanced general ventilation by mechanical means.(PROC6)
	Pressing uncured rubber blanks	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 90 %)(PROC14)
	Tyre build up	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 95 %)(PROC7)
	Vulcanisation Manual	Minimise exposure by extracted full enclosure for the operation or equipment. Provide enhanced general ventilation by mechanical means.(PROC6)
	Cooling cured articles	Minimise exposure by extracted full enclosure for the operation or equipment. Provide enhanced general ventilation by mechanical means.(PROC6)
	Production of articles by dipping and pouring	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC13)

	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. (Efficiency: 90 %)(PROC8a)
	Storage	Store substance within a closed system. 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.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Additive premixing	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC5)
	Calendering (including Banburys)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC6)
	Tyre build up	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)
	Vulcanisation Manual	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC6)
	Cooling cured articles	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC6)
	Production of articles by dipping and pouring	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)
	Equipment maintenance	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,292mg/L	0,487
ERC4	---	Marine water	PEC	4,02mg/kg dwt	0,486
ERC4	---	Fresh water sediment	PEC	0,029mg/kg dwt	0,487
ERC4	---	Marine sediment	PEC	0,402mg/kg dwt	0,484
ERC4	---	Sewage treatment plant (STP)	PEC	2,92mg/L	0,106
ERC4	---	Agricultural soil	PEC	0,656mg/kg dwt	0,505

ESVOC spERC 4.19a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2	---	Worker - inhalative, long-term - systemic	---	0,5
PROC1, PROC2	---	Worker - dermal, long-term - systemic	---	0,1
PROC3, PROC4, PROC8b, PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC3, PROC4, PROC8b, PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC5, PROC6, PROC8a, PROC13, PROC14	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC5, PROC6, PROC8a, PROC13, PROC14	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC7	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC7	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC21	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC21	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 6: Polymer processing		
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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC6: Calendering operations 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) PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC21: Low energy manipulation of substances bound in materials and/or articles	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	100 ton(s)/year
	Daily amount per site	5 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	250 kg/day
	Emission or Release Factor: Water	0 kg/day
	Emission or Release Factor: Soil	0 kg/day
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
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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13, PROC14)
	Exposed skin areas	Two hands 960 cm² (PROC6, PROC8a)
	Exposed skin areas	Hands and forearms. 1980 cm² (PROC21)
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers (closed systems)	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. Handle substance within a closed system.(PROC1, PROC2)
	Bulk transfers	Handle substance within a closed system. Provide extract ventilation to material transfer points and other openings.(PROC8b)
	Bulk weighing	Handle substance within a closed system. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC1, PROC2)
	Small scale weighing	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC9)
	Additive premixing	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC3, PROC4)
	Additive premixing	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC5)
	Bulk transfers	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC8b, PROC9)
	Calendering (including Banburys)	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC6)
	Production of articles by dipping and pouring	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC13)
	Extrusion and masterbatching	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC14)
	Injection moulding of articles	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC14)

	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. (Efficiency: 90 %)(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Additive premixing	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC5)
	Calendering (including Banburys)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC6)
	Production of articles by dipping and pouring	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)
	Extrusion and masterbatching	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC14)
	Injection moulding of articles	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC14)
	Equipment maintenance	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,000255mg/L	0
ERC4	---	Marine water	PEC	0,004mg/kg dwt	0
ERC4	---	Fresh water sediment	PEC	0,0000233mg/kg dwt	0
ERC4	---	Marine sediment	PEC	0,000321mg/kg dwt	0
ERC4	---	Sewage treatment plant (STP)	PEC	0mg/L	0
ERC4	---	Agricultural soil	PEC	0,000601mg/kg dwt	0

ESVOC spERC 4.21a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2,	---	Worker - inhalative, long-	---	0,1 - 0,5

PROC3, PROC4, PROC8b, PROC9		term - systemic		
PROC1, PROC2, PROC3, PROC4, PROC8b, PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC5, PROC6, PROC8a, PROC13	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC5, PROC6, PROC8a, PROC13	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC14	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC14	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC21	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC21	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 7: 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 PROC6: Calendering operations 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 tabletting, 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	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,001 kg/day
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
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC6, 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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC8b, PROC14)
	Exposed skin areas	Two hands 960 cm² (PROC6, PROC8a)
	Exposed skin areas	Hands and forearms. 1980 cm² (PROC21)
Technical conditions and measures to control dispersion	Bulk transfers	Handle substance within a closed system.

from source towards the worker	Small package filling	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC1, PROC2)
	Material transfers	Transfer via enclosed lines. Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Injection moulding of articles	Minimise exposure by extracted full enclosure for the operation or equipment. Provide enhanced general ventilation by mechanical means.(PROC6, PROC14)
	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. (Efficiency: 80 %)(PROC8a)
	Storage	Store substance within a closed system. Provide enhanced general ventilation by mechanical means.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Injection moulding of articles	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC6, PROC14)
	Equipment maintenance	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A filter or better.(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,000655mg/L	0,001
ERC8a	---	Fresh water sediment	PEC	0,009mg/kg dwt	0,001
ERC8a	---	Marine water	PEC	0,0000572mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,000789mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,0000321mg/L	0
ERC8a	---	Agricultural soil	PEC	0,0000386mg/kg dwt	0

ESVOC spERC 8.21b.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC1, PROC2	---	Worker - dermal, long-term - systemic	---	0,1
PROC6, PROC14	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC6, PROC14	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8a	---	Worker - inhalative, long-term - systemic	---	0,1
PROC8a	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC21	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC21	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 8: Uses in coatings	
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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	1470 ton(s)/year
	Daily amount per site	4,99 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	489,02 kg/day
	Emission or Release Factor: Water	99,8 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, 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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13, PROC14)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC7)
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 exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)
	Film formation - force drying (50-100°C). stoving (>100°C). UV/EB radiation curing	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC2)
	Mixing operations (closed systems) General exposures (closed systems)	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC3)
	Film formation - air drying	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC4)
	Preparation of material for application Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC5)
	Spraying (automatic/robotic)	Carry out in a vented booth provided with laminar airflow. (Efficiency: 95 %)(PROC7)
	Manual Spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC7)
	Material transfers	Clear transfer lines prior to de-coupling. Provide extract ventilation to points where emissions occur.(PROC8a, PROC8b)
	Roller, spreader, flow application	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 90 %)(PROC10)
	Dipping, immersion and	Avoid manual contact with wet work pieces.

	pouring	Provide extract ventilation to points where emissions occur.(PROC13)
	Material transfers Drum/batch transfers Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC9)
	Production of preparations or articles by tabletting, compression, extrusion, pelettisation	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC14)
Conditions and measures related to personal protection, hygiene and health evaluation	Preparation of material for application Mixing operations (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC5)
	Spraying (automatic/robotic)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC7)
	Manual Spraying	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)
	Material transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a, PROC8b)
	Roller, spreader, flow application	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Dipping, immersion and pouring	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,583mg/L	0,972
ERC4	---	Fresh water sediment	PEC	8,04mg/kg dwt	0,972
ERC4	---	Marine water	PEC	0,058mg/kg dwt	0,972
ERC4	---	Marine sediment	PEC	0,803mg/kg dwt	0,967
ERC4	---	Sewage treatment	PEC	5,82mg/L	0,212

		plant (STP)			
ERC4	---	Agricultural soil	PEC	1,3mg/kg dwt	1

ESVOC spERC 4.3a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC1	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC2	---	Worker - inhalative, long-term - systemic	---	0,5
PROC2	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC3	---	Worker - inhalative, long-term - systemic	---	0,1
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC5, PROC8a, PROC10, PROC13, PROC14	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC5, PROC8a, PROC10, PROC13, PROC14	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC7	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC7	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC9	---	Worker - inhalative, long-	---	0,1 - 0,5

		term - systemic		
PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC15	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - dermal, long-term - systemic	---	< 0,1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 9: Uses in coatings	
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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,022 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(PROC13)
	Frequency of use	1 hours/day(PROC4, PROC8a, PROC8b, PROC10,

		PROC19)
	Frequency of use	15 minutes/day(PROC11)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC11)
	Exposed skin areas	Hands and forearms. 1980 cm² (PROC19)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Limit the substance content in the mixture to 5 %., Outdoor.(PROC11)	
	Limit the substance content in the mixture to 25 %., Indoor(PROC11)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Filling / preparation of equipment from drums or containers	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC2)
	General exposures (closed systems) Use in contained systems	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC2)
	Preparation of material for application	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. (Efficiency: 30 %)(PROC3)
	Film formation - air drying	Ensure operation is undertaken outdoors. or When indoor: Provide extract ventilation to points where emissions occur.(PROC4)
	Preparation of material for application	Ensure operation is undertaken outdoors. or When indoor: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC5)
	Material transfers Drum/batch transfers	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 90 %)(PROC8a)
	Material transfers Drum/batch transfers	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC8b)
	Roller, spreader, flow application	Ensure operation is undertaken outdoors. or

		When indoor: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
	Manual Spraying Indoor	Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC11)
	Manual Spraying Outdoor.	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC11)
	Dipping, immersion and pouring Indoor	Provide extract ventilation to points where emissions occur. Avoid manual contact with wet work pieces.(PROC13)
	Dipping, immersion and pouring Outdoor.	Ensure operation is undertaken outdoors. Avoid manual contact with wet work pieces.(PROC13)
	Laboratory activities	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC15)
	Hand application - finger paints, pastels, Adhesives Indoor	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC19)
	Hand application - finger paints, pastels, Adhesives Outdoor.	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC19)
Conditions and measures related to personal protection, hygiene and health evaluation	Film formation - air drying	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC4)
	Preparation of material for application	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A filter or better.(PROC5)
	Material transfers Drum/batch transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC8a)
	Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Manual Spraying Indoor	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Manual Spraying Outdoor.	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear a respirator conforming to EN140 with Type A

	filter or better.(PROC11)
Dipping, immersion and pouring Indoor	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)
Dipping, immersion and pouring Outdoor.	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear a respirator conforming to EN140 with Type A filter or better.(PROC13)
Hand application - finger paints, pastels, Adhesives Indoor	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC19)
Hand application - finger paints, pastels, Adhesives Outdoor.	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC19)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,00078mg/L	0,001
ERC8a	---	Fresh water sediment	PEC	0,011mg/kg dwt	0,001
ERC8a	---	Marine water	PEC	0,0000697mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,000961mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,001mg/L	0
ERC8a	---	Agricultural soil	PEC	0,000315mg/kg dwt	0

ESVOC spERC 8.3b.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC1	---	Worker - dermal, long-	---	< 0,1

		term - systemic		
PROC2, PROC8a, PROC10	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC2, PROC8a, PROC10	---	Worker - dermal, long-term - systemic	---	0,1
PROC3	---	Worker - inhalative, long-term - systemic	---	0,75 - 1
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,5
PROC4	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC5	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC5	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC11	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC11	---	Worker - dermal, long-term - systemic	---	0,5
PROC13, PROC19	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC13, PROC19	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - inhalative, long-term - systemic	---	0,1
PROC15	---	Worker - dermal, long-term - systemic	---	< 0,1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures /

Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 10: 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 ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8c, ERC8d, ERC8f		
As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.		
2.2 Contributing scenario controlling consumer exposure for: PC1: Glues, hobby use		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	5 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
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% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	6,39 kg
Frequency and duration of use	Frequency of use	1 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 110 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Avoid using when windows closed.
2.4 Contributing scenario controlling consumer exposure for: PC1: Glue from spray		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	85,05 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.5 Contributing scenario controlling consumer exposure for: PC1: Sealants		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%

	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	75 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Avoid using when windows closed.
2.6 Contributing scenario controlling consumer exposure for: PC4: Washing car window		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 1%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
2.7 Contributing scenario controlling consumer exposure for: PC4: Pouring into radiator		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1,2%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa

Amount used	Amount used per event	2 kg
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
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 2,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	4 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 214,4 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
2.9 Contributing scenario controlling consumer exposure for: PC8: Laundry and dish washing products		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	15 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per	30 min

	event	
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.10 Contributing scenario controlling consumer exposure for: PC8: Cleaners, liquids		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.11 Contributing scenario controlling consumer exposure for: PC8: Cleaners, trigger sprays		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 15%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.12 Contributing scenario controlling consumer exposure for: PC9a: Waterborne latex wall		

paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
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 27,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	744 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.14 Contributing scenario controlling consumer exposure for: PC9a: Aerosol spray can		
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	26,4 hPa
Amount used	Amount used per event	215 g
Frequency and duration of use	Frequency of use	2 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
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% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	491 g
Frequency and duration of use	Frequency of use	3 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.16 Contributing scenario controlling consumer exposure for: PC9b: Fillers and putty		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	85 g
Frequency and duration of use	Frequency of use	12 days/year
	Frequency of use	1 Times per day

	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,73 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

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 1,2%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	13,8 kg
Frequency and duration of use	Frequency of use	12 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Avoid using when windows closed.

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	26,4 hPa
Amount used	Amount used per event	1 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min

Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 254,4 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.19 Contributing scenario controlling consumer exposure for: PC9c: Finger paints

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 0,2%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	1,35 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 254,4 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

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

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

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 27,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	744 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.22 Contributing scenario controlling consumer exposure for: PC15: Aerosol spray can		
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	26,4 hPa
Amount used	Amount used per event	215 g
Frequency and duration of use	Frequency of use	2 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
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	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid

	Vapour pressure	26,4 hPa
Amount used	Amount used per event	491 g
Frequency and duration of use	Frequency of use	3 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.24 Contributing scenario controlling consumer exposure for: PC18		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	40 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 71,4 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.25 Contributing scenario controlling consumer exposure for: PC23: Polishes, wax/cream (floor, furniture, shoes)		
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	26,4 hPa
Amount used	Amount used per event	56 g
Frequency and duration of use	Frequency of use	29 days/year
	Frequency of use	1 Times per day

	Exposure duration per event	73,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.26 Contributing scenario controlling consumer exposure for: PC23: Polishes, spray (furniture, shoes)		
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	26,4 hPa
Amount used	Amount used per event	56 g
Frequency and duration of use	Frequency of use	8 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	73,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
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	26,4 hPa
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm²
Other given operational conditions affecting consumers	Room size	34 m3

exposure		
2.28 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	26,4 hPa
Amount used	Amount used per event	34 g
Frequency and duration of use	Frequency of use	10 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.29 Contributing scenario controlling consumer exposure for: PC24: Sprays		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	73 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
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	liquid

	use)	
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	142 g
Frequency and duration of use	Frequency of use	29 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	73,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

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 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	8 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 430 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.32 Contributing scenario controlling consumer exposure for: PC34

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 2,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	115 g
Frequency and duration of use	Frequency of use	365 days/year

	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Consumers

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

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
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.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 11: 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

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	1050 ton(s)/year
	Daily amount per site	10,5 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	3150 kg/day
	Emission or Release Factor: Water	1,05 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(PROC4)

	Frequency of use	1 hours/day(PROC3, PROC10)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC8b, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC7)
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	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC8b)
	Filling / preparation of equipment from drums or containers	Ensure material transfers are under containment or extract ventilation. (Efficiency: 97 %)(PROC8b)
	Use in contained batch processes	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC4)
	Degreasing small objects in cleaning station	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC13)
	Cleaning with low-pressure washers	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC10)
	Cleaning with high pressure washers	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC7)
	Manual Surfaces cleaning No spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC10)
Conditions and measures related to personal protection, hygiene and health evaluation	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Automated process with (semi) closed systems Drum/batch transfers Use in contained systems	Wear a respirator conforming to EN140 with Type A filter or better. (Efficiency: 90 %)(PROC3)
	Use in contained batch processes	Wear a respirator conforming to EN140 with Type A filter or better. (Efficiency: 90 %)(PROC4)
	Degreasing small objects in cleaning station	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)
	Cleaning with low-pressure washers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC10)
	Cleaning with high pressure washers	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC7)

	Manual Surfaces cleaning No spraying	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,006mg/L	0,011
ERC4	---	Fresh water sediment	PEC	0,088mg/kg dwt	0,011
ERC4	---	Marine water	PEC	0,000637mg/kg dwt	0,011
ERC4	---	Marine sediment	PEC	0,009mg/kg dwt	0,011
ERC4	---	Sewage treatment plant (STP)	PEC	0,061mg/L	0,002
ERC4	---	Agricultural soil	PEC	0,05mg/kg dwt	0,039

ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Worker - inhalative, long-term - systemic	---	0,5
PROC2	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC3, PROC7	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC3, PROC7	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8b, PROC13	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b,	---	Worker - dermal, long-	---	0,1 - 0,5

PROC13		term - systemic		
PROC10	---	Worker - inhalative, long-term - systemic	---	0,75
PROC10	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 12: Use in Cleaning Agents	
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 PROC10: Roller application or brushing 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

2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(PROC2, PROC3, PROC10)
	Frequency of use	1 hours/day(PROC4, PROC11, PROC13)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2,

		PROC4, PROC8b, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC11)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Limit the substance content in the mixture to 25 %.(PROC8b)	
	Limit the substance content in the mixture to 5 %.(PROC10)	
	Limit the substance content in the mixture to 1 %.(PROC11)	
Technical conditions and measures to control dispersion from source towards the worker	Filling / preparation of equipment from drums or containers	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC8b)
	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC4)
	Filling / preparation of equipment from drums or containers	Ensure operation is undertaken outdoors.(PROC8a)
	Manual Surfaces cleaning Dipping, immersion and pouring	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC13)
	Cleaning with low-pressure washers Rolling, Brushing No spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC10)
	Cleaning with high pressure washers Spraying Indoor	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). (Efficiency: 70 %)(PROC11)
	Cleaning with high pressure washers Spraying Outdoor.	Ensure operation is undertaken outdoors.(PROC11)
	Manual Surfaces cleaning Spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
	Ad hoc manual application via trigger sprays, dipping, etc Rolling, Brushing	Provide extract ventilation to points where emissions occur. (Efficiency: 80 %)(PROC10)

	Application of cleaning products in closed systems	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC4)
	Cleaning of medical devices	Provide extract ventilation to points where emissions occur. (Efficiency: 80 %)(PROC4)
Conditions and measures related to personal protection, hygiene and health evaluation	Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)(PROC4)
	Filling / preparation of equipment from drums or containers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear a respirator conforming to EN140 with Type A filter or better.(PROC8a)
	Manual Surfaces cleaning Dipping, immersion and pouring	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC13)
	Cleaning with low-pressure washers Rolling, Brushing No spraying	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Cleaning with high pressure washers Spraying Indoor	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC11)
	Cleaning with high pressure washers Spraying Outdoor.	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.(PROC11)
	Manual Surfaces cleaning Spraying	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.(PROC10)
	Ad hoc manual application via trigger sprays, dipping, etc Rolling, Brushing	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Application of cleaning products in closed systems	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
	Cleaning of medical	Wear a respirator conforming to EN140 with Type A

devices	filter or better. (Efficiency: 90 %)(PROC4)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,000652mg/L	0,001
ERC8a	---	Fresh water sediment	PEC	0,009mg/kg dwt	0,001
ERC8a	---	Marine water	PEC	0,0000569mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,000784mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	< 0,0000001mg/L	0
ERC8a	---	Agricultural soil	PEC	0,0000315mg/kg dwt	0

ESVOC spERC 8.4b.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC10	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC2, PROC10	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC3, PROC11	---	Worker - inhalative, long-term - systemic	---	0,75
PROC3, PROC11	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,75
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8a, PROC8b, PROC13	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8a,	---	Worker - dermal, long-	---	0,1 - 0,5

PROC8b, PROC13		term - systemic		

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

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

1. Short title of Exposure Scenario 13: 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 PC9b: Fillers, putties, plasters, modelling clay PC9c: Finger paints PC24: Lubricants, greases, release products PC35: Washing and cleaning products (including solvent based products) PC38: Welding and soldering products (with flux coatings or flux cores), flux products	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.		
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	26,4 hPa
Amount used	Amount used per event	0,1 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	4 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
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	26,4 hPa
Amount used	Amount used per event	0,48 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	480 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 35,7 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
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	26,4 hPa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
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 1,2%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	2 kg
Frequency and duration of use	Frequency of use	365 days/year

	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
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 2,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	4 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 214,4 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3
2.7 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	26,4 hPa
Amount used	Amount used per event	15 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	30 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational	Room size	20 m3

conditions affecting consumers exposure		
2.8 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	26,4 hPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.9 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	26,4 hPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.10 Contributing scenario controlling consumer exposure for: PC9a: Waterborne latex wall paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1,5%

	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.11 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 27,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	744 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.12 Contributing scenario controlling consumer exposure for: PC9a: Aerosol spray can

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	215 g

Frequency and duration of use	Frequency of use	2 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	34 m3

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

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	491 g
Frequency and duration of use	Frequency of use	3 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.14 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	26,4 hPa
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm²

Other given operational conditions affecting consumers exposure	Room size	34 m3

2.15 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	26,4 hPa
Amount used	Amount used per event	34 g
Frequency and duration of use	Frequency of use	10 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	480 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 468 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.16 Contributing scenario controlling consumer exposure for: PC24: Sprays

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	73 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428,75 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.17 Contributing scenario controlling consumer exposure for: PC35: Laundry and dish washing products

Product characteristics	Concentration of the Substance in	Covers concentrations up to 5%

	Mixture/Article	
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	15 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	30 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.18 Contributing scenario controlling consumer exposure for: 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	26,4 hPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

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

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 15%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa

Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 428 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

2.20 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	26,4 hPa
Amount used	Amount used per event	12 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Consumers

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

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

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

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.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 14: 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	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,005 kg/day
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
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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day(PROC1, PROC2)
	Frequency of use	4 hours/day(PROC11)
	Frequency of use	1 hours/day(PROC4, PROC8a, PROC8b, PROC13)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1)
	Exposed skin areas	Two hands 480 cm² (PROC2, PROC4, PROC8b, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC11)

Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Limit the substance content in the mixture to 25 %.(PROC8a, PROC13)	
Technical conditions and measures to control dispersion from source towards the worker	Mixing in containers	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC4)
	Spraying/fogging by manual application	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC11)
	Spraying/fogging by machine application	Provide extract ventilation to points where emissions occur. Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.(PROC11)
	Operation of equipment containing engine oils and similar	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Disposal of wastes	Ensure operation is undertaken outdoors. (Efficiency: 30 %)(PROC8a)
	Storage	Store substance within a closed system. Ensure operation is undertaken outdoors.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Transfer from/pouring from containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Spraying/fogging by manual application	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Spraying/fogging by machine application	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC13)
	Operation of equipment containing engine oils and similar	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC8a)
	Disposal of wastes	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,000681mg/L	0,001
ERC8a	---	Fresh water sediment	PEC	0,009mg/kg dwt	0,001
ERC8a	---	Marine water	PEC	0,0000598mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,000824mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,000289mg/L	0
ERC8a	---	Agricultural soil	PEC	0,0000953mg/kg dwt	0

ESVOC spERC 8.11a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC1, PROC2	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8a, PROC13	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC8a, PROC13	---	Worker - dermal, long-term - systemic	---	0,1
PROC8b, PROC11	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b, PROC11	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 15: 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	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.		
2.2 Contributing scenario controlling consumer exposure for: PC12		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 0,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3
2.3 Contributing scenario controlling consumer exposure for: PC27		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 0,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	26,4 hPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per	19,8 min

	event	
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area: 857,5 cm²
Other given operational conditions affecting consumers exposure	Room size	20 m3

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Consumers

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

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
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.
For scaling see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 16: Use as lubricants		
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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	175 ton(s)/year
	Daily amount per site	8,75 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	13,125 kg/day
	Emission or Release Factor: Water	8,75 kg/day
	Emission or Release Factor: Soil	0 kg/day
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
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18		
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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC8b, PROC9, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10, PROC17, PROC18)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC7)
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 exposures (closed systems)	Handle substance within a closed system.(PROC2)
	General exposures (closed systems) Raw material handling	Handle substance within a closed system. 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. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8b)
	Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container. (Efficiency: 90 %)(PROC8a, PROC8b)
	Initial factory fill of equipment	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC9)
	Operation and lubrication of high energy open equipment	Provide extract ventilation to points where emissions occur. Restrict area of openings to equipment.(PROC17, PROC18)
	Rolling, Brushing Manual	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC10)
	Treatment by dipping and pouring	Restrict area of openings to equipment. Allow time for product to drain from workpiece. Provide enhanced general ventilation by mechanical means.(PROC13)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 95 %)(PROC7)
	Maintenance and machine set up	Provide enhanced general ventilation by mechanical means. Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Maintenance of small items	Provide enhanced general ventilation by mechanical means.

		Avoid manual contact with wet work pieces. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Remanufacture of reject articles	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC9)
	Storage	Store substance within a closed system. Transfer via enclosed lines.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a, PROC8b)
	Initial factory fill of equipment	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC9)
	Operation and lubrication of high energy open equipment	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC17, PROC18)
	Rolling, Brushing Manual	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC10)
	Treatment by dipping and pouring	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC13)
	Spraying	Wear suitable gloves (tested to EN374), coverall and eye protection. (Efficiency: 95 %)(PROC7)
	Maintenance and machine set up	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Maintenance of small items	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Remanufacture of reject articles	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC9)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,051mg/L	0,086
ERC4	---	Fresh water sediment	PEC	0,707mg/kg dwt	0,085

ERC4	---	Marine water	PEC	0,005mg/kg dwt	0,086
ERC4	---	Marine sediment	PEC	0,071mg/kg dwt	0,085
ERC4	---	Sewage treatment plant (STP)	PEC	0,511mg/L	0,019
ERC4	---	Agricultural soil	PEC	0,113mg/kg dwt	0,087

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

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC2	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC3	---	Worker - inhalative, long-term - systemic	---	0,75 - 1
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,5
PROC4	---	Worker - dermal, long-term - systemic	---	0,1
PROC7, PROC8a, PROC13	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC7, PROC8a, PROC13	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC9	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC9	---	Worker - dermal, long-term - systemic	---	0,1
PROC10	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC10	---	Worker - dermal, long-	---	0,1 - 0,5

		term - systemic		
PROC17	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC17	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC18	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC18	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 17: Use as lubricants	
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 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 PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,004 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day

	Frequency of use	4 hours/day(PROC8a, PROC8b, PROC9)
	Frequency of use	1 hours/day(PROC10, PROC11, PROC17, PROC18)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC8b, PROC9, PROC13, PROC20)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10, PROC17, PROC18)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC11)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Limit the substance content in the mixture to 25 %.(PROC8a)	
	Limit the substance content in the mixture to 5 %.(PROC17)	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system. 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.(PROC2, PROC3)
	Operation of equipment containing engine oils and similar	Restrict area of openings to equipment. 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.(PROC20)
	General exposures (open systems)	Ensure material transfers are under containment or extract ventilation. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8b)
	Filling / preparation of equipment from drums or containers Dedicated facility	Use drum pumps or carefully pour from container. (Efficiency: 80 %)(PROC8b)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8a)
	Operation and lubrication of high energy open equipment Indoor	Restrict area of openings to equipment. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC17, PROC18)
	Maintenance (of larger plant items) and machine set up	Provide enhanced general ventilation by mechanical means. Clear transfer lines prior to de-coupling.(PROC8b)

	Maintenance of small items	Provide enhanced general ventilation by mechanical means. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Engine lubricant service	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC9)
	Rolling, Brushing Manual	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC10)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 80 %)(PROC11)
	Treatment by dipping and pouring	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 90 %)(PROC13)
	Storage	Store substance within a closed system. Ensure operation is undertaken outdoors.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Operation and lubrication of high energy open equipment Indoor	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC17, PROC18)
	Maintenance (of larger plant items) and machine set up	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Maintenance of small items	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Engine lubricant service	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC9)
	Rolling, Brushing Manual	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Spraying	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)
	Treatment by dipping and pouring	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC13)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,000676mg/L	0,001
ERC8a	---	Fresh water sediment	PEC	0,009mg/kg dwt	0,001
ERC8a	---	Marine water	PEC	0,0000593mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,000817mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,000241mg/L	0
ERC8a	---	Agricultural soil	PEC	0,0000847mg/kg dwt	0

ESVOC spERC 8.6c.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2, PROC3, PROC8a, PROC20	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC2, PROC3, PROC8a, PROC20	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC4	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC9	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC10,	---	Worker - inhalative, long-	---	0,5

PROC11, PROC13, PROC17, PROC18		term - systemic		
PROC10, PROC11, PROC13, PROC17, PROC18	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 18: Use as Functional Fluids	
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 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

2.1 Contributing scenario controlling environmental exposure for: ERC7		
Amount used	Annual amount per site	120 ton(s)/year
	Daily amount per site	0,5 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	2,5 kg/day
	Emission or Release Factor: Water	0,5 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, 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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(PROC8a)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2,

		PROC4, PROC8b, PROC9)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC8b)
	Transfer from/pouring from containers (closed systems)	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC9)
	Filling / preparation of equipment from drums or containers Manual	Provide extract ventilation to material transfer points and other openings. (Efficiency: 90 %)(PROC8a)
	General exposures (open systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC4)
	Remanufacture of reject articles	Retain drain downs in sealed storage pending disposal or for subsequent recycle. Drain down system prior to equipment opening or maintenance. Provide extract ventilation to points where emissions occur.(PROC9)
	Equipment maintenance	Drain down system prior to equipment opening or maintenance.(PROC8a)
	Storage	Store substance within a closed system. 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.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Equipment maintenance	Wear suitable gloves tested to EN374.(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC7	---	Fresh water	PEC	0,003mg/L	0,005
ERC7	---	Fresh water sediment	PEC	0,044mg/kg dwt	0,005
ERC7	---	Marine water	PEC	0,000316mg/k	0,005

				g dwt	
ERC7	---	Marine sediment	PEC	0,004mg/kg dwt	0,005
ERC7	---	Sewage treatment plant (STP)	PEC	0,029mg/L	0,001
ERC7	---	Agricultural soil	PEC	0,007mg/kg dwt	0,005

ESVOC spERC 7.13a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC1, PROC2	---	Worker - dermal, long-term - systemic	---	0,1
PROC4, PROC8b, PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC4, PROC8b, PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8a	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8a	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 19: 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems	
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC9a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,002 kg/day
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
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC9, 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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day(PROC9)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands 480 cm² (PROC2, PROC9, PROC20)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers	Ensure material transfers are under containment or extract ventilation. Use drum pumps or carefully pour from

		container.(PROC8a)
	Transfer from/pouring from containers Filling / preparation of equipment from drums or containers Manual	Ensure material transfers are under containment or extract ventilation. Use drum pumps or carefully pour from container.(PROC9)
	General exposures (closed systems)	Handle substance within a predominantly closed system provided with extract ventilation. (Efficiency: 80 %)(PROC1, PROC3)
	General exposures (open systems)	Use dry break couplings for material transfer. Restrict area of openings to equipment.(PROC20)
	Remanufacture of reject articles	Provide extract ventilation to points where emissions occur. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Equipment maintenance	Use drum pumps or carefully pour from container. Drain down system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Drum/batch transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Equipment maintenance	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC9a	---	Fresh water	PEC	0,000661mg/L	0,001
ERC9a	---	Fresh water sediment	PEC	0,009mg/kg dwt	0,001
ERC9a	---	Marine water	PEC	0,0000579mg/kg dwt	0,001
ERC9a	---	Marine sediment	PEC	0,000798mg/kg dwt	0,001
ERC9a	---	Sewage treatment	PEC	0,0000963mg/	0

		plant (STP)		L	
ERC9a	---	Agricultural soil	PEC	0,0000528mg/ kg dwt	0

ESVOC spERC 9.13b.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2, PROC3	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC1, PROC2, PROC3	---	Worker - dermal, long-term - systemic	---	0,1
PROC8a, PROC20	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8a, PROC20	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 20: Use in laboratories		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	100 ton(s)/year
	Daily amount per site	5 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	125 kg/day
	Emission or Release Factor: Water	100 kg/day
	Emission or Release Factor: Soil	0 kg/day
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
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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day(PROC15)
	Frequency of use	1 hours/day(PROC10)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC15)
	Exposed skin areas	Two hands 960 cm² (PROC10)
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	Retain drain downs in sealed storage pending disposal or for subsequent recycle. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC10)
	Laboratory activities	Handle within a fume cupboard or implement

		suitable equivalent methods to minimise exposure.(PROC15)
Conditions and measures related to personal protection, hygiene and health evaluation	cleaning	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,584mg/L	0,973
ERC4	---	Marine water	PEC	8,05mg/kg dwt	0,973
ERC4	---	Fresh water sediment	PEC	0,058mg/kg dwt	0,973
ERC4	---	Marine sediment	PEC	0,805mg/kg dwt	0,97
ERC4	---	Sewage treatment plant (STP)	PEC	5,84mg/L	0,212
ERC4	---	Agricultural soil	PEC	1,29mg/kg dwt	0,992

ESVOC spERC 4.24.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC10	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - dermal, long-term - systemic	---	< 0,1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 21: 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	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,028 kg/day
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
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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day(PROC15)
	Frequency of use	1 hours/day(PROC10)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC15)
	Exposed skin areas	Two hands 960 cm² (PROC10)
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	Retain drain downs in sealed storage pending disposal or for subsequent recycle. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC10)
	Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.(PROC15)
Conditions and measures related to personal protection, hygiene and health evaluation	cleaning	Wear suitable gloves tested to EN374.(PROC10)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,000812mg/L	0,001
ERC8a	---	Fresh water sediment	PEC	0,011mg/kg dwt	0,001
ERC8a	---	Marine water	PEC	0,0000729mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,001mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,002mg/L	0
ERC8a	---	Agricultural soil	PEC	0,000386mg/kg dwt	0

ESVOC spERC 8.17.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC10	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC15	---	Worker - dermal, long-term - systemic	---	< 0,1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 22: Use in metal working fluids / rolling oils	
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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	100 ton(s)/year
	Daily amount per site	5 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	30 kg/day
	Emission or Release Factor: Water	5 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

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

	use)	
	Vapour pressure	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	1 hours/day(PROC8b)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10, PROC17)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC7)
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system. 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.(PROC1, PROC2, PROC3)
	General exposures (open systems)	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. (Efficiency: 30 %)(PROC4)
	Bulk transfers	Provide enhanced general ventilation by mechanical means. Clear transfer lines prior to de-coupling.(PROC8b)
	Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container. (Efficiency: 90 %)(PROC5)
	Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container. (Efficiency: 90 %)(PROC8b, PROC9)
	Process sampling	Use dedicated equipment.(PROC8b)
	Metal machining operations	Provide extract ventilation to points where emissions occur. Restrict area of openings to equipment.(PROC17)
	Treatment by dipping and pouring	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC13)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 95 %)(PROC7)
	Rolling, Brushing Manual	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC10)
	Automated metal rolling/forming	Carry out in a vented booth provided with laminar airflow. (Efficiency: 95 %)(PROC2)
	Semi-automated metal	Minimise exposure by partial enclosure of the

	rolling/forming	operation or equipment and provide extract ventilation at openings.(PROC17, PROC4)
	Equipment cleaning and maintenance Dedicated facility	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8b)
	Equipment cleaning and maintenance Non-dedicated facility	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8a)
	Storage	Store substance within a closed system. Transfer via enclosed lines. Avoid dip sampling.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures (open systems)	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC5)
	Process sampling	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Metal machining operations	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC17)
	Treatment by dipping and pouring	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)
	Spraying	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC7)
	Rolling, Brushing Manual	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC10)
	Semi-automated metal rolling/forming	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC17, PROC4)
	Equipment cleaning and maintenance Dedicated facility	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Equipment cleaning and maintenance Non-dedicated facility	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,029mg/L	0,049
ERC4	---	Marine water	PEC	0,003mg/kg dwt	0,049
ERC4	---	Fresh water sediment	PEC	0,406mg/kg dwt	0,049
ERC4	---	Marine sediment	PEC	0,04mg/kg dwt	0,049
ERC4	---	Sewage treatment plant (STP)	PEC	0,292mg/L	0,011
ERC4	---	Agricultural soil	PEC	0,065mg/kg dwt	0,05

ESVOC spERC 4.7a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2, PROC3	---	Worker - inhalative, long-term - systemic	---	0,75 - 1
PROC1, PROC2, PROC3	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC4	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC4	---	Worker - dermal, long-term - systemic	---	0,1
PROC5, PROC17	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC5, PROC17	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC7, PROC8b	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC7, PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8a, PROC10, PROC13	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC8a, PROC10, PROC13	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - dermal, long-	---	0,5 - 0,75

		term - systemic		

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 23: Use in metal working fluids / rolling oils	
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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities 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 PROC17: Lubrication at high energy conditions and in partly open process
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 kg/day
	Emission or Release Factor: Water	0,003 kg/day
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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, 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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day

	Frequency of use	1 hours/day(PROC8a, PROC8b, PROC11)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC10, PROC17)
	Exposed skin areas	Two hands and upper wrists 1500 cm² (PROC11)
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 exposures (closed systems)	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. Handle substance within a closed system.(PROC1, PROC2)
	General exposures (closed systems)	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC3)
	Bulk transfers	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8b)
	Filling / preparation of equipment from drums or containers Dedicated facility	Use drum pumps or carefully pour from container. (Efficiency: 80 %)(PROC8b, PROC9)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Provide enhanced general ventilation by mechanical means. (Efficiency: 70 %)(PROC8a)
	Process sampling	Use dedicated equipment.(PROC8b)
	Metal machining operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 90 %)(PROC17)
	Rolling, Brushing Manual	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC10)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC11)
	Treatment by dipping and pouring	Allow time for product to drain from workpiece. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC13)
	Equipment cleaning and maintenance Non-dedicated facility	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a)
	Equipment cleaning and	Provide enhanced general ventilation by

	maintenance Dedicated facility	mechanical means. Drain or remove substance from equipment prior to break-in or maintenance.(PROC8b)
	Storage	Store substance within a closed system.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Bulk transfers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Filling / preparation of equipment from drums or containers Dedicated facility	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b, PROC9)
	Filling / preparation of equipment from drums or containers Non-dedicated facility	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
	Process sampling	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Metal machining operations	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear a respirator conforming to EN140 with Type A filter or better.(PROC17)
	Rolling, Brushing Manual	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC10)
	Spraying	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)
	Treatment by dipping and pouring	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC13)
	Equipment cleaning and maintenance Non-dedicated facility	Wear suitable gloves tested to EN374. Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC8a)
	Equipment cleaning and maintenance Dedicated facility	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,000668mg/L	0,001
ERC8a	---	Fresh water	PEC	0,009mg/kg	0,001

		sediment		dwt	
ERC8a	---	Marine water	PEC	0,0000585mg/kg dwt	0,001
ERC8a	---	Marine sediment	PEC	0,000806mg/kg dwt	0,001
ERC8a	---	Sewage treatment plant (STP)	PEC	0,000160mg/L	0
ERC8a	---	Agricultural soil	PEC	0,0000669mg/kg dwt	0

ESVOC spERC 8.7c.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1, PROC2	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC1, PROC2	---	Worker - dermal, long-term - systemic	---	0,1
PROC3	---	Worker - inhalative, long-term - systemic	---	0,75 - 1
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC8a, PROC10, PROC11, PROC13	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8a, PROC10, PROC11, PROC13	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,5 - 0,75
PROC8b	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC9	---	Worker - dermal, long-term - systemic	---	0,1
PROC17	---	Worker - inhalative, long-term - systemic	---	0,1
PROC17	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 24: Use as water treatment chemicals		
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 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	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	32 ton(s)/year
	Daily amount per site	0,106 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	5,3 kg/day
	Emission or Release Factor: Water	100,7 kg/day
	Emission or Release Factor: Soil	0 kg/day
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
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, 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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2,

		PROC4, PROC8b, PROC13)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers	Transfer via enclosed lines. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC2)
	Drum/batch transfers	Use drum pumps. Avoid spillage when withdrawing pump.(PROC8b)
	General exposures (closed systems)	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC3)
	General exposures (open systems)	Restrict area of openings to equipment. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC4)
	Pouring from small containers	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC13)
	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC8a)
	Storage	Store substance within a closed system.(PROC1)
Conditions and measures related to personal protection, hygiene and health evaluation	Pouring from small containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC13)
	Equipment maintenance	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,588mg/L	0,98
ERC4	---	Marine water	PEC	8,1mg/kg dwt	0,979
ERC4	---	Fresh water sediment	PEC	0,059mg/kg dwt	0,98
ERC4	---	Marine sediment	PEC	0,81mg/kg dwt	0,976
ERC4	---	Sewage treatment plant (STP)	PEC	5,88mg/L	0,214
ERC4	---	Agricultural soil	PEC	1,3mg/kg dwt	1

ESVOC spERC 3.22a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC1	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC2	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC2	---	Worker - dermal, long-term - systemic	---	0,1
PROC3	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC3	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC4	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8a, PROC13	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8a, PROC13	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 25: 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

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Amount used	Annual amount per site	100 ton(s)/year
	Daily amount per site	1,44 ton(s)/day
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	7,2 kg/day
	Emission or Release Factor: Water	100,8 kg/day
	Emission or Release Factor: Soil	0 kg/day
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

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	26,4 hPa
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	1 hours/day(PROC8a, PROC8b)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2,

		PROC4, PROC8b)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers from tote tanks and supply vessels	Handle substance within a closed system.(PROC8b)
	Filling / preparation of equipment from drums or containers	Handle substance within a closed system.(PROC8b)
	Drilling mud (re-)formulation	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC3)
	Drill floor operations	Provide extract ventilation to points where emissions occur. (Efficiency: 80 %)(PROC4)
	Operation of solids filtering equipment - vapour exposures	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. (Efficiency: 95 %)(PROC4)
	Operation of solids filtering equipment - aerosol exposures	Formulate in enclosed or ventilated mixing vessels. Ensure material transfers are under containment or extract ventilation.(PROC4)
	Cleaning of solids filtering equipment	Ensure material transfers are under containment or extract ventilation. Avoid dip sampling.(PROC8a)
	Treatment and disposal of filtered solids	Handle in a fume cupboard or under extract ventilation. (Efficiency: 90 %)(PROC3)
	Process sampling	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours.(PROC3)
	Pouring from small containers	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC8a)
	General exposures (open systems) Scale squeeze operations	Provide extract ventilation to points where emissions occur. (Efficiency: 90 %)(PROC4)
	Equipment cleaning and maintenance	Use drum pumps or carefully pour from container. Avoid spillage when withdrawing pump.(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Bulk transfers from tote tanks and supply vessels	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8b)
	Filling / preparation of equipment from drums or containers	Wear a respirator conforming to EN140 with Type A filter or better. (Efficiency: 90 %)(PROC8b)
	Drill floor operations	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)

Operation of solids filtering equipment - vapour exposures	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
Operation of solids filtering equipment - aerosol exposures	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC4)
Cleaning of solids filtering equipment	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
Pouring from small containers	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)
Equipment cleaning and maintenance	Wear suitable gloves tested to EN374. (Efficiency: 80 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,588mg/L	0,98
ERC4	---	Fresh water sediment	PEC	8,11mg/kg dwt	0,981
ERC4	---	Marine water	PEC	0,059mg/kg dwt	0,98
ERC4	---	Marine sediment	PEC	0,811mg/kg dwt	0,977
ERC4	---	Sewage treatment plant (STP)	PEC	5,88mg/L	0,214
ERC4	---	Agricultural soil	PEC	1,3mg/kg dwt	1

ESVOC spERC 4.5a.v1 has been used to evaluate the exposure for the environment.

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - systemic	---	< 0,1
PROC1	---	Worker - dermal, long-term - systemic	---	< 0,1
PROC2, PROC3	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC2, PROC3	---	Worker - dermal, long-	---	< 0,1

		term - systemic		
PROC4	---	Worker - inhalative, long-term - systemic	---	0,5
PROC4	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75
PROC8a	---	Worker - inhalative, long-term - systemic	---	0,5
PROC8a	---	Worker - dermal, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - inhalative, long-term - systemic	---	0,1 - 0,5
PROC8b	---	Worker - dermal, long-term - systemic	---	0,5 - 0,75

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
For scaling see: http://www.ecetoc.org/tra
The environmental emission has been evaluated using EUSES 2.1 (http://ecb.jrc.ec.europa.eu/euses), in which default values have been used, unless otherwise indicated.
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

1. Short title of Exposure Scenario 26: Other consumer uses

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC28: Perfumes, fragrances PC39: Cosmetics, personal care 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

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

2.2 Contributing scenario controlling consumer exposure for: PC28, PC39

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

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Consumers

No exposure assessment presented for human health.

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

No specific advice available

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