Dr. Grogg Chemie AG
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CH-3066 Stettlen-Deisswil

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COVER SHEET FOR THE SAFETY DATA SHEET

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Item number: G910

Trade name: Toluene pure

Supplier:
Dr. Grogg Chemie AG
Gümligentalstrasse 83
CH-3066 Stettlen-Deisswil
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Emergency number:
24-hour emergency number: 145
Help with poisoning. Tox Info Suisse provides free medical advice round the clock in cases of poisoning or suspected poisoning.

Tox Info Suisse
Freiestrasse 16
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Tel. +41 (0) 44 251 51 51
www.toxinfo.ch

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

TOLUOL

Version 3.0 Print Date 25.11.2026

Revision date / valid from 22.12.2023

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

1.1. Product identifier

Trade name	:	TOLUOL
Substance name	:	toluene
Index-No.	:	601-021-00-3
CAS-No.	:	108-88-3
EC-No.	:	203-625-9
EU REACH-Reg. No.	:	01-2119471310-51-xxxx

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

Use of the Substance/Mixture	:	Identified use: See table in front of appendix for a complete overview of identified uses.
Uses advised against	:	At this moment we have not identified any uses advised against
Remarks	:	Before referring to any Exposure Scenario attached to this Safety Data Sheet please check the grade of the product: the Exposure Scenarios presented are not related to all product grade

1.3. Details of the supplier of the safety data sheet

Company	:	Brenntag Schweizerhall AG Elsässerstrasse 231 CH 4002 Basel
Telephone	:	+41 (0)58 344 80 00
Telefax	:	+41 (0)58 344 82 08
E-mail address	:	doku@brenntag.ch
Responsible/issuing person	:	Abteilung Produktsicherheit

1.4. Emergency telephone number

Emergency telephone number	:	Swiss Toxicological Information Centre CH-8032 ZÜRICH Tel.: +41 (0) 44 251 51 51 National emergency call: 145

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Flammable liquids	Category 2	---	H225
Reproductive toxicity	Category 2	---	H361d
Aspiration hazard	Category 1	---	H304
Skin irritation	Category 2	---	H315
Specific target organ toxicity - single exposure	Category 3	Central nervous system	H336
Specific target organ toxicity - repeated exposure	Category 2	Central nervous system	H373
Long-term (chronic) aquatic hazard	Category 3	---	H412

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

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical hazards : See section 9/10 for physicochemical information.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :



Signal word : Danger

Hazard statements :

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting

effects.

Precautionary statements			
Prevention	:	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	:	P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
		P331	Do NOT induce vomiting.
		P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Hazardous components which must be listed on the label:

• toluene

2.3. Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: No information available about endocrine disruption properties for environment.

Toxicological information: No information available about endocrine disruption properties for human health.

The vapour may be invisible, heavier than air and spread along ground. Vapors may produce explosive mixtures with air at temperatures over the flash point.

SECTION 3: Composition/information on ingredients

3.1. Substances

Hazardous components			Amount [%]	Classification (REGULATION (EC) No 1272/2008)	
				Hazard class / Hazard category	Hazard statements
toluene					
Index-No.	:	601-021-00-3	>= 90 - <= 100	Flam. Liq.2	H225
CAS-No.	:	108-88-3		Repr.2	H361d
EC-No.	:	203-625-9		Asp. Tox.1	H304

EU REACH-Reg. No.	: 01-2119471310-51-xxxx	Skin Irrit.2	H315
		STOT SE3	H336
		STOT RE2	H373
		Aquatic Chronic3	H412

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	: Remove from exposure, lie down. Take off all contaminated clothing immediately.
If inhaled	: Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position. Consult a physician after significant exposure.
In case of skin contact	: Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 10 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Rinse mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Call a physician immediately.
Protection of First Aid Responders	: First Aid responders should pay attention to self-protection and use the recommended protective clothing.

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

Symptoms	: Inhalation can cause CNS-depression and narcosis. Inhalation may provoke the following symptoms: Irregular cardiac activity, See Section 11 for more detailed information on health effects and symptoms.
Effects	: May be fatal if swallowed and enters airways. May cause drowsiness or dizziness. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure. See Section 11 for more detailed information on health effects and symptoms.

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

Treatment	: Treat symptomatically.Symptoms may be delayed.The exposed person may need to be kept under medical

surveillance for 48 hours.No further information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	:	High volume water jet

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	The vapour may be invisible, heavier than air and spread along ground. Vapours may form explosive mixtures with air. Flash back possible over considerable distance. The product is insoluble and floats on water.
Hazardous combustion products	:	Carbon monoxide, Carbon dioxide (CO2), Irritant gases/vapours

5.3. Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.Wear personal protective equipment.
Further advice	:	Cool closed containers exposed to fire with water spray.Heating will cause a pressure rise - with risk of bursting.Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Keep away from heat and sources of ignition. Use personal protective equipment. Keep away unprotected persons. Provide adequate ventilation. Avoid contact with skin and eyes. Do not breathe vapours or spray mist.

6.2. Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4. Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on personal protective equipment.
See Section 13 for waste treatment information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	:	Keep container tightly closed. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.
Hygiene measures	:	Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in original container. Keep in an area equipped with solvent resistant flooring.
Advice on protection against fire and explosion	:	Keep away from sources of ignition - No smoking. The vapour may be invisible, heavier than air and spread along ground. Vapours may form explosive mixtures with air. Take measures to prevent the build up of electrostatic charge. Use only in an area containing explosion proof equipment.
Fire-fighting class	:	Highly flammable and extremely fast burning down; Flp < 21°C
Further information on storage conditions	:	Keep tightly closed in a dry and cool place. Keep away from direct sunlight. Keep in a well-ventilated place.
Advice on common storage	:	Incompatible with strong acids and oxidizing agents. Do not store together with oxidizing and self-igniting products. Keep away from food, drink and animal feedingstuffs.
German storage class	:	3 Flammable liquids
Suitable packaging materials	:	Mild steel, Stainless steel
Unsuitable packaging materials	:	, natural rubber, Nitrile rubber. Ethylene-propylene-diene monomer (EPDM), PVC

7.3. Specific end use(s)

Specific use(s)	:	Identified use: See table in front of appendix for a complete overview of identified uses.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component:	toluene	CAS-No. 108-88-3

Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)

DNEL Workers, Long-term - systemic effects, Inhalation	:	192 mg/m3
DNEL Workers, Long-term - local effects, Inhalation	:	192 mg/m3
DNEL Workers, Acute - systemic effects, Inhalation	:	384 mg/m3
DNEL Workers, Acute - local effects, Inhalation	:	384 mg/m3
DNEL Workers, Long-term - systemic effects, Skin contact	:	384 mg/kg bw/day
DNEL Consumers, Long-term - systemic effects, Inhalation	:	56,5 mg/m3
DNEL Consumers, Long-term - local effects, Inhalation	:	56,5 mg/m3
DNEL Consumers, Acute - systemic effects, Inhalation	:	226 mg/m3
DNEL Consumers, Acute - local effects, Inhalation	:	226 mg/m3
DNEL Consumers, Long-term - systemic effects, Skin contact	:	226 mg/kg bw/day
DNEL Consumers, Long-term - systemic effects, Ingestion	:	8,13 mg/kg bw/day

Predicted No Effect Concentration (PNEC)

Fresh water (AF = 1), extrapolated	:	0,68 mg/l

Marine water (AF = 1), extrapolated	:	0,68 mg/l
Intermittent releases (AF = 1), extrapolated	:	0,68 mg/l
Sewage treatment plant (STP) (AF = 1), extrapolated	:	13,61 mg/l
Fresh water sediment Partition coefficient	:	16,39 mg/kg dry weight (d.w.)
Marine sediment	:	16,39 mg/kg dry weight (d.w.)
Soil Partition coefficient	:	2,89 mg/kg dry weight (d.w.)

Other Occupational Exposure Limit Values

EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended, Time Weighted Average (TWA):
50 ppm, 192 mg/m3
Indicative

EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended, Short Term Exposure Limit (STEL):
100 ppm, 384 mg/m3
Indicative

Switzerland. OELs. Limit Values at the Workplace, as per SUVA, as amended, Short Term Exposure Limit (STEL):
200 ppm, 760 mg/m3

Switzerland. OELs. Limit Values at the Workplace, as per SUVA, as amended, Time Weighted Average (TWA):
50 ppm, 190 mg/m3

Switzerland. OELs. Limit Values at the Workplace, as per SUVA, as amended
If in compliance with the OEL and BEL values, then there should be no risk of reproductive damage.

Switzerland. OELs. Limit Values at the Workplace, as per SUVA, as amended, Skin designation:
Can be absorbed through the skin.

Biological Exposure Indices

Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA), as amended, Hippuric acid, Creatinine in urine

2 g/g, Sampling time: c) Long term exposure after several (4-5) work shifts. b) End of exposure / end of shift.
Unspecified parameter, Environmental effects
Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA), as amended, toluene, Blood
600 µg/l, Sampling time: End of exposure / end of shift.
Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA), as amended, o-Cresol, Urine
0,5 mg/l, Sampling time: b) End of exposure / end of shift. c) Long term exposure after several (4-5) work shifts.
Quantitative Interpretation difficult

8.2. Exposure controls

Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice	:	In case of brief exposure or low pollution use breathing filter apparatus. Respiratory protection complying with EN 141. Recommended Filter type:A In case of intensive or longer exposure use self-contained breathing apparatus.

Hand protection

Advice	:	Protective gloves complying with EN 374. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Protective gloves should be replaced at first signs of wear.
Material	:	fluorocarbon rubber
Break through time	:	>= 8 h
Glove thickness	:	0,4 mm

Material	:	Viton®
Break through time	:	> 240 min
Glove thickness	:	0,7 mm

Eye protection

Advice	:	Safety goggles

Skin and body protection

Advice	:	Solvent resistant protective clothing

Environmental exposure controls

General advice	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	:	liquid
Physical state	:	liquid
Colour	:	colourless
Odour	:	aromatic
Odour Threshold	:	1,77 ppm
Melting point/range	:	-95 °C
Boiling point/boiling range	:	110 - 111 °C
Flammability (solid, gas)	:	Product is a liquid, see section 9.2.
Upper explosion limit / Upper flammability limit	:	7,1 %(V)
Lower explosion limit / Lower flammability limit	:	1,2 %(V)
Flash point	:	4 °C
Auto-ignition temperature	:	480 - 536 °C
Decomposition temperature	:	No data available
Self-Accelerating decomposition temperature (SADT)	:	No data available
pH	:	Not applicable
Viscosity		
Viscosity, dynamic	:	0,6 mPa.s (20 °C)
Viscosity, kinematic	:	0,63 mm2/s (25 °C)
Flow time	:	No data available
Solubility(ies)		
Water solubility	:	0,5 g/l (15 °C)
Solubility in other solvents	:	No data available
Dissolution Rate	:	No data available

Partition coefficient: n-octanol/water	:	log Pow: 2,65 (measured)
Dispersion Stability	:	No data available
Vapour pressure	:	30 - 35 hPa (20 °C)
Relative density	:	No data available
Density	:	0,871 g/cm3 (15 °C)
Bulk density	:	No data available
Relative vapour density	:	3,1

Particle characteristics
No data available

9.2 Other information

Explosives	:	Product is not explosive. Formation of explosive air/vapour mixtures is possible.
Oxidizing properties	:	not oxidising
Flammability (liquids)	:	Highly flammable liquid and vapour.
Evaporation rate	:	5 Method: DIN 53170 (ether = 1)
Molecular weight	:	92,14 g/mol

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : No decomposition if stored and applied as directed.

10.2. Chemical stability

Advice : Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions : Vapours may form explosive mixture with air. Forms a detonable mixture with nitric acid.

10.4. Conditions to avoid

Conditions to avoid : Heat, flames and sparks.Keep away from direct sunlight.

10.5. Incompatible materials

Materials to avoid : Strong oxidizing agents, Strong acids, Strong bases, Halogenated compounds

10.6. Hazardous decomposition products

Hazardous decomposition products : Under fire conditions: Carbon oxides, Hydrocarbons, Aldehydes

SECTION 11: Toxicological information

11.1. Information on the hazard classes within the meaning of Regulation (EC) No. 1272/2008

Component:	toluene	CAS-No. 108-88-3
Acute toxicity		
Oral		
LD50	:	5580 mg/kg (Rat, male) (OECD Test Guideline 401)
Inhalation		
LC50	:	28,1 mg/l (Rat, male and female; 4 h; vapour) (OECD Test Guideline 403)
LC50	:	25,7 mg/l (Rat, male; 4 h; vapour) (OECD Test Guideline 403)
LC50	:	30 mg/l (Rat, female; 4 h; vapour) (OECD Test Guideline 403)
Dermal		
LD50	:	> 5000 mg/kg (Rabbit, male)
Irritation		
Skin		
Result	:	Irritating to skin. (Rabbit) (OECD Test Guideline 404)Danger by skin absorption.
Eyes		
Result	:	No eye irritation (Rabbit) (OECD Test Guideline 405)
Sensitisation		
Result	:	not sensitizing (Maximisation Test; Guinea pig) (OECD Test Guideline 406)
CMR effects		
CMR Properties		
Carcinogenicity	:	Animal testing did not show any carcinogenic effects.

Mutagenicity	:	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects
Teratogenicity	:	Animal experiments showed teratogenic effects. Suspected of damaging the unborn child.
Reproductive toxicity	:	Animal testing did not show any effects on fertility.

Specific Target Organ Toxicity		
Single exposure		
Inhalation	:	Target Organs: Central nervous systemMay cause drowsiness or dizziness.

Repeated exposure		
Inhalation	:	May cause damage to organs through prolonged or repeated exposure.

Other toxic properties
Aspiration hazard
May be fatal if swallowed and enters airways.,

11.2. Information on other hazards

Data for the product		
Endocrine disrupting properties		
Assessment	:	No information available about endocrine disruption properties for human health.

SECTION 12: Ecological information

12.1. Toxicity

Component:	toluene	CAS-No. 108-88-3
Acute toxicity		
Fish		
LC50	:	5,5 mg/l (Oncorhynchus kisutch (coho salmon); 96 h) (flow-through test)

Toxicity to daphnia and other aquatic invertebrates

LC50	:	3,78 mg/l (Ceriodaphnia dubia (water flea); 48 h) (US-EPA)

algae

EC50	:	134 mg/l (Chlamydomonas angulosa; 3 h)

Bacteria

EC50	:	84 mg/l (Nitrosomonas sp; 24 h)

Chronic toxicity

Fish

NOEC	:	1,39 mg/l (Oncorhynchus kisutch (Coho salmon); 40 d)

Aquatic invertebrates

NOEC		0,74 mg/l (Ceriodaphnia dubia (water flea); 7 d)

12.2. Persistence and degradability

Data for the product

Persistence and degradability

Persistence

Result	:	The product is insoluble and floats on water. The product evaporates easily from water surface.
Result	:	

Component:	**toluene**	**CAS-No. 108-88-3**

Persistence and degradability

Persistence

Result	:	Oxidises rapidly by photo-chemical reactions in air.

Biodegradability

Result	:	86 % (Exposure Time: 20 d)Readily biodegradable.

12.3. Bioaccumulative potential

Component:	toluene	CAS-No. 108-88-3
Bioaccumulation		

Result : log Kow 2,73 (20 °C; pH 7)
: BCF: 90; The product has low potential bioaccumulation.

12.4. Mobility in soil

Component:	toluene	CAS-No. 108-88-3
Mobility		

Water : Floats on water.
Soil : Mobile in soils

12.5. Results of PBT and vPvB assessment

Data for the product
Results of PBT and vPvB assessment

Result : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6. Endocrine disrupting properties

Data for the product		
Endocrine disrupting potential	:	No information available about endocrine disruption properties for environment.

12.7. Other adverse effects

Component:	toluene	CAS-No. 108-88-3
Additional ecological information		

Result : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services. This

product shall be disposed of or recovered in compliance with Directive 2008/98/EC on waste as lastly amended.

Contaminated packaging : Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. If recycling is not practicable, dispose of in compliance with local regulations. Do not burn, or use a cutting torch on, the empty drum. Risk of explosion.

European Waste Catalogue Number : No waste code can be defined for this product in accordance with the Ordinance on the Movement of Waste (VeVA), as the intended use dictates the assignment. The waste code is established in consultation with a regional waste disposer, such as:

Brenntag Schweizerhall AG
Lohnmatte 1
4573 Lohn-Ammannsegg
Switzerland
Phone: +41 58 344 84 00
infolohn@brenntag.ch

SECTION 14: Transport information

14.1. UN number or ID number

1294

14.2. UN proper shipping name

ADR : TOLUENE
RID : TOLUENE
IMDG : TOLUENE

14.3. Transport hazard class(es)

ADR-Class	: 3
(Labels; Classification Code; Hazard Identification Number; Tunnel restriction code)	3; F1; 33; (D/E)
RID-Class	: 3
(Labels; Classification Code; Hazard Identification Number)	3; F1; 33
IMDG-Class	: 3
(Labels; EmS)	3; F-E, S-D

14.4. Packaging group

ADR : II
RID : II
IMDG : II

14.5. Environmental hazards

Environmentally hazardous according to ADR	:	no
Environmentally hazardous according to RID	:	no
Marine Pollutant according to IMDG-Code	:	no

14.6. Special precautions for user

Not applicable.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Data for the product

CPID	:	295906-27
Threshold quantity MAO	:	20.000 kg (2015 determined by law SR814.012 Ann. 1 ch. 4)
Ordinance protection of air	:	LRV (CH): chapter 72 - class 2

Ordinance on Chemical Risik Reduction:

Annex	:	Annex 1.10: Carcinogenic, mutagenic and reproductive toxic substances Annex 1.11: Hazardous liquids Annex 1.12: Benzene and homologues
Other regulations	:	Article 4 para. 4 of the Ordinance on the protection of young people in the workplace (SR 822.115) and Articles 5 and 6 of the EAER regulation on hazardous work and young people (SR 822.115.2): Young people undergoing basic vocational training may only work with this product if the relevant training ordinance makes provision for them to do so with a view to enabling them to achieve their training objectives and if the preconditions for the training plan have been met and the applicable age restrictions have been complied with. Young people who are not completing any basic vocational training are not permitted to work with this product. Employees of either sex who are under 18 years old are classed as young people. Article 13 Maternity ordinance (SR 822.111.52): Expectant and nursing mothers are only permitted to come into contact with this product during the course of their work if, based on a risk assessment carried out in accordance with Article 63 of Ordinance 1 on the Employment Act (ArGV 1) (SR 822.111), the chemicals in question have been found not to cause any specific harm to mothers or children or if such harm can be

ruled out by taking appropriate protective measures.

Component:	**toluene**	**CAS-No. 108-88-3**

EU. Chemicals Subject to PIC Procedure: Regulation 649/2012/EU on export and import of dangerous chemicals, as amended	:	; The substance/mixture does not fall under this legislation.
EU. Regulation 273/2004, Drug Precursors, Category 3	:	Scheduled substance Combined Nomenclature (CN) code: , 2902 30 00
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	Point Nos.: , 40; Listed Point Nos.: , 3; Listed Point Nos.: , 48; Listed EC Number: , 203-625-9
EU. Regulation No. 1223/2009 on cosmetic products, Annex III: List of Restricted Substances in Cosmetic Products	:	Reference number: 185; Listed
EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I	:	Qualifying quantity for the application of Lower-tier requirements: 5.000 tonnes; Part 1: Categories of dangerous substances; Flammable liquids, Categories 2 or 3 not covered by P5a and P5b, The information given is valid if the product is stored below the boiling point and at a pressure of 1013 hPa. Qualifying quantity for the application of Upper-tier requirements: 50.000 tonnes; Part 1: Categories of dangerous substances; Flammable liquids, Categories 2 or 3 not covered by P5a and P5b, The information given is valid if the product is stored below the boiling point and at a pressure of 1013 hPa.

Notification status toluene:

Regulatory List	Notification	Notification number

AICS	YES	
DCS (JP)	YES	(3)-60
DCS (JP)	YES	(3)-2
DSL	YES	
EINECS	YES	203-625-9
ENCS (JP)	YES	(3)-2
IECSC	YES	
INSQ	YES	
ISHL (JP)	YES	(3)-2
ISHL (JP)	YES	2-(8)-869
JEX (JP)	YES	(3)-2
KECI (KR)	YES	97-1-298
KECI (KR)	YES	KE-33936
NZIOC	YES	HSR001227
ONT INV	YES	
PICCS (PH)	YES	
TCSI	YES	
TH INV	YES	55-1-00534
TH INV	YES	2902.30
TH INV	YES	3824.90
TSCA	YES	
VN INVL	YES	

15.2. Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

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

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Full text of the Notes referred to under section 3.

Abbreviations and Acronyms

AU AIICL	Australia. Industrial Chemicals Act (AIIC) List
BCF	bioconcentration factor
BOD	biochemical oxygen demand
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging

CMR	carcinogenic, mutagenic or toxic to reproduction
COD	chemical oxygen demand
DNEL	derived no-effect level
DSL	Canada. Environmental Protection Act, Domestic Substances List
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
ENCS (JP)	Japan. Kashin-Hou Law List
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
IECSC	China. Inventory of Existing Chemical Substances
INSQ	Mexico. National Inventory of Chemical Substances
ISHL (JP)	Japan. Inventory of Industrial Safety & Health
KECI (KR)	Korea. Existing Chemicals Inventory
LC50	median lethal concentration
LOAEC	lowest observed adverse effect concentration
LOAEL	lowest observed adverse effect level
LOEL	lowest observed effect level
NDSL	Canada. Environmental Protection Act. Non-Domestic Substances List
NLP	no-longer polymer
NOAEC	no observed adverse effect concentration
NOAEL	no observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
NZIOC	New Zealand. Inventory of Chemicals
OECD	Organisation for Economic Cooperation and Development
OEL	occupational exposure limit
ONT INV	Canada. Ontario Inventory List
PBT	persistent, bioaccumulative and toxic
PHARM (JP)	Japan. Pharmacopoeia Listing
PICCS (PH)	Philippines. Inventory of Chemicals and Chemical Substances
PNEC	predicted no-effect concentration
REACH Auth. No.:	REACH Authorisation Number
REACH AuthAppC. No.	REACH Authorisation Application Consultation Number
UK REACH Auth. No.:	UK REACH Authorisation Number
UK REACH AuthAppC. No.	UK REACH Authorisation Application Consultation Number
UK REACH-Reg.No	UK REACH Registration Number
STOT	specific target organ toxicity
SPM	Synthetic Polymer Microparticles
SVHC	substance of very high concern
TCSI	Taiwan. Existing Chemicals Inventory

TH INV	Thailand. Existing Chemicals Inventory from FDA
TSCA	US. Toxic Substances Control Act
UVCB	substance of unknown or variable composition, complex reaction products or biological materials
VN INVL	Vietnam. National Chemical Inventory

Further information

Key literature references and sources for data	:	Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.
Methods used for product classification	:	The classification for human health, physical and chemical hazards and environmental hazards were derived from a combination of calculation methods and if available test data.
Hints for trainings	:	The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safety Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.
Other information	:	The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship. The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

|| Indicates updated section.

No.	Short title	REACH Auth. No.:/ REACH AuthAppC. No.	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	NA	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	1	NA	ES642
2	Distribution of substance	NA	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	1, 2	NA	ES1679
3	Formulation & (re)packing of substances and mixtures	NA	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES1689
4	Use in rubber production and processing	NA	3	8, 9, 10	NA	1, 2, 3, 4, 5, 6, 8a, 8b, 13, 14	4, 6d	NA	ES747
5	Use in coatings	NA	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	4	NA	ES696
6	Use in coatings	NA	21	NA	1, 4, 8, 9a, 9b, 9c, 15, 18, 23, 24, 31	NA	8a, 8d	NA	ES671
7	Use in coatings	NA	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES656
8	Use in cleaning agents	NA	3	10	NA	2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES707
9	Use in cleaning agents	NA	22	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	8a, 8d	NA	ES717
10	Use in binder and release agents	NA	3	NA	NA	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14	4, 5	NA	ES731
11	Use in binder and release agents	NA	22	NA	NA	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14	8a, 8d	NA	ES733
12	Use in fuel	NA	3	10	NA	1, 2, 3, 4, 8a, 8b, 16	7	NA	ES735
13	Use in fuel	NA	22	NA	NA	1, 2, 3, 8a, 8b, 16	9a, 9b	NA	ES737
14	Use as Functional Fluids	NA	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9	7	NA	ES739
15	Use as Functional Fluids	NA	22	NA	NA	1, 2, 3, 8a, 9, 20	9a, 9b	NA	ES741

16	Use in laboratories	NA	3	NA	NA	10, 15	2, 4	NA	ES743
17	Use in laboratories	NA	22	NA	NA	10, 15	8a, 8d	NA	ES745
18	Use in oil and gas field drilling and production operations	NA	3	10	NA	1, 2, 3, 4, 8a, 8b	4	NA	ES729
19	Use as an intermediate	NA	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES648
20	Use in road and construction applications	NA	22	NA	NA	8a, 8b, 9, 10, 11, 13	8d, 8f	NA	ES9219

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: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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
Activity	Manufacture of substance. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container)

2.1 Contributing scenario controlling environmental exposure for: ERC1		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 1.1v1 has been used to evaluate the exposure for the environment.		
Amount used	Regional use tonnage:	3 Million tonnes/year
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	300000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	300000
Environment factors not influenced by risk management	Dilution Factor (River)	40
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,5 %
	Emission or Release Factor: Water	0,01 %
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):, If discharging to domestic sewage treatment plant, no secondary wastewater treatment required., Risk from environmental exposure is driven by wastewater treatment plant microbes., Prevent discharge of undissolved

Organizational measures to prevent/limit release from the site		substance to or recover from onsite wastewater. (Degradation effectiveness: 93,3 %)
	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 90 %)
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	During manufacturing no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	During manufacturing no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Storage	recommended: Avoid dip sampling. Provide extract ventilation to material transfer points and other openings.(PROC2)
	General exposures (closed systems) With sample collection	recommended: Handle substance within a predominantly closed system provided with extract ventilation. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Ensure material transfers are under containment or extract ventilation.(PROC2)
	General exposures (closed systems)	recommended: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC3)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. recommended: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Provide extract ventilation to points where emissions occur. Clear spills immediately. Retain drain downs in sealed storage pending

		disposal or for subsequent recycle.(PROC8a)
	Bulk transfers Open systems Closed systems Process sampling	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). recommended: Clear transfer lines prior to de-coupling.(PROC8b)
	Laboratory activities	recommended: Handle in a fume cupboard or under extract ventilation.(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Bulk transfers Open systems Closed systems Process sampling	Ensure operatives are trained to minimise exposures.(PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 1.1.v1: EUSES 2.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 1.1.v1	---	---	Maximum safe use per site	4070000 kg/day	---
ESVOC SPERC 1.1.v1	---	Fresh water	PEC	0,0852mg/l	0,125
ESVOC SPERC 1.1.v1	---	Fresh water sediment	PEC	0,0336mg/kg wet weight	0,0495
ESVOC SPERC 1.1.v1	---	Marine water	PEC	0,446mg/l	0,125
ESVOC SPERC 1.1.v1	---	Marine sediment	PEC	0,176mg/kg wet weight	0,0494
ESVOC SPERC 1.1.v1	---	Soil	PEC	0,0655mg/kg wet weight	0,0257
ESVOC SPERC 1.1.v1	---	Sewage treatment plant (STP)	PEC	3,35mg/l	0,246

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,20
PROC2	---	All routes	---	0,20
PROC3	---	Dermal worker exposure	0,34mg/kg/day	0
PROC3	---	Inhalation worker	25ppm	0,49

		exposure		
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg/day	0,02
PROC4	---	Inhalation worker exposure	25ppm	0,39
PROC4	---	All routes	---	0,41
PROC8a	---	Dermal worker exposure	0,14mg/kg/day	0
PROC8a	---	Inhalation worker exposure	10ppm	0,2
PROC8a	---	All routes	---	0,2
PROC8b	---	Dermal worker exposure	6,86mg/kg/day	0,02
PROC8b	---	Inhalation worker exposure	15ppm	0,29
PROC8b	---	All routes	---	0,31
PROC15	---	Dermal worker exposure	0,34mg/kg/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,2
PROC15	---	All routes	---	0,2

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 2: 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: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC2: Formulation of preparations
Activity	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 1.1b.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	3 Million tonnes/year
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	300000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	300000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,01 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0,001 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 90 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or

measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Process sampling	recommended: Avoid dip sampling.(PROC2)
	Storage	recommended: Locate bulk storage outdoors.(PROC2)
	General exposures (open systems)	recommended: Clear transfer lines prior to de-coupling.(PROC4)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. recommended: Transfer via enclosed lines. Apply vessel entry procedures including use of forced supplied air. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Bulk transfers Open systems Closed systems	recommended: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Clear transfer lines prior to de-coupling.(PROC8b)
	Drum and small package filling	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Clear transfer lines prior to de-coupling. Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Put lids on containers immediately after use. Clear spills immediately.(PROC9)

	Laboratory activities	recommended: Handle in a fume cupboard or under extract ventilation.(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Bulk transfers Open systems Closed systems	Ensure operatives are trained to minimise exposures.(PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 1.1b.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 1.1b.v1	---	---	Maximum safe use per site	13600000 kg/day	---
ESVOC SPERC 1.1b.v1	---	Fresh water	PEC	0,0349mg/l	0,0514
ESVOC SPERC 1.1b.v1	---	Fresh water sediment	PEC	0,183mg/kg wet weight	0,0514
ESVOC SPERC 1.1b.v1	---	Marine water	PEC	0,00348mg/l	0,00511
ESVOC SPERC 1.1b.v1	---	Marine sediment	PEC	0,0182mg/kg wet weight	0,00511
ESVOC SPERC 1.1b.v1	---	Soil	PEC	0,166mg/kg wet weight	0,0653
ESVOC SPERC 1.1b.v1	---	Sewage treatment plant (STP)	PEC	0,335mg/l	0,0246

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,2
PROC2	---	All routes	---	0,2
PROC3	---	Dermal worker exposure	0,34mg/kg/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41

PROC8a	---	Dermal worker exposure	0,14mg/kg/day	0
PROC8a	---	Inhalation worker exposure	10ppm	0,2
PROC8a	---	All routes	---	0,2
PROC8b	---	Dermal worker exposure	6,86mg/kg/day	0,29
PROC8b	---	Inhalation worker exposure	15ppm	0,29
PROC8b	---	All routes	---	0,31
PROC2	---	Dermal worker exposure	1,37mg/kg/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,2
PROC2	---	All routes	---	0,2
PROC15	---	Dermal worker exposure	0,34mg/kg/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,2
PROC15	---	All routes	---	0,2
PROC9	---	All routes	---	0,70
PROC9	---	Inhalation worker exposure	35ppm	0,69
PROC9	---	Dermal worker exposure	6,86mg/kg/day	0,02

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 3: 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: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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, pelletisation PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations
Activity	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC2

Substance is a unique structure, Readily biodegradable.
, ESVOC spERC 2.2.v1 has been used to evaluate the exposure for the environment.

Amount used	Amounts used in the EU (tonnes/year)	150000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	15000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	2,5 %
	Emission or Release Factor: Water	0,2 %
	Emission or Release Factor: Soil	0,01 %

	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Batch processes at elevated temperatures	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur.(PROC3)
	Process sampling	recommended: Avoid dip sampling.(PROC3)
	Laboratory activities	recommended: Handle in a fume cupboard or under extract ventilation.(PROC15)
	Mixing operations (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Provide extract ventilation to points where emissions occur.(PROC5)
	Bulk transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Clear lines prior to de-coupling. Ensure material transfers are under containment or extract ventilation. Clear spills immediately.(PROC8b)

	Manual Transfer from/pouring from containers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Provide extract ventilation to points where emissions occur.(PROC8a)
	Drum/batch transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Use drum pumps or carefully pour from container. Provide extract ventilation to points where emissions occur. Avoid spillage when withdrawing pump.(PROC8b)
	Production or preparation or articles by tabletting, compression, extrusion or pelletisation	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Provide extract ventilation to points where emissions occur.(PROC14)
Organisational measures to prevent /limit releases, dispersion and exposure	Bulk transfers	Return IBCs or tanks to supplier for re-use.(PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 2.2.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 2.2.v1	---	---	Maximum safe use per site	67800 kg/day	---
ESVOC SPERC 2.2.v1	---	Fresh water	PEC	0,336mg/l	0,495
ESVOC SPERC 2.2.v1	---	Fresh water sediment	PEC	1,76mg/kg wet weight	0,495
ESVOC SPERC 2.2.v1	---	Marine water	PEC	0,0336mg/l	0,0495
ESVOC SPERC 2.2.v1	---	Marine sediment	PEC	0,176mg/kg wet weight	0,0494
ESVOC SPERC 2.2.v1	---	Soil	PEC	1,67mg/kg wet weight	0,654
ESVOC SPERC 2.2.v1	---	Sewage treatment plant (STP)	PEC	3,35mg/l	0,246

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0

PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,20
PROC2	---	All routes	---	0,20
PROC3	---	Dermal worker exposure	0,34mg/kg/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC5	---	Dermal worker exposure	13,71mg/kg/day	0,04
PROC5	---	Inhalation worker exposure	35ppm	0,69
PROC5	---	All routes	---	0,73
PROC8a	---	Dermal worker exposure	13,71mg/kg/day	0,04
PROC8a	---	Inhalation worker exposure	35ppm	0,69
PROC8a	---	All routes	---	0,73
PROC8b	---	Dermal worker exposure	6,86mg/kg/day	0,02
PROC8b	---	Inhalation worker exposure	35ppm	0,69
PROC8b	---	All routes	---	0,73
PROC9	---	Dermal worker exposure	6,86mg/kg/day	0,02
PROC9	---	Inhalation worker exposure	35ppm	0,69
PROC9	---	All routes	---	0,73
PROC14	---	Dermal worker exposure	3,43mg/kg/day	0,01
PROC14	---	Inhalation worker exposure	35ppm	0,69
PROC14	---	All routes	---	0,70
PROC15	---	Dermal worker exposure	0,34mg/kg/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,20
PROC15	---	All routes	---	0,20

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 4: Use in rubber production and processing	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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 PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
Activity	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6d		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 4.19a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	60000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	6000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	6000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	0,3 %
	Emission or Release	0,01 %

	Factor: Soil	
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC21		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Material transfers	recommended: Provide extract ventilation to material transfer points and other openings. Remotely vent displaced vapours.(PROC1, PROC2)
	Material transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Transfer materials directly to mixing vessels. Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC8b, PROC9)
	Bulk weighing	recommended: Ensure material transfers are under containment or extract ventilation.(PROC1, PROC2)
	Small scale weighing	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
	Additive premixing	Provide a good standard of general ventilation (not

		less than 3 to 5 air changes per hour).(PROC5)
	Calendering (including Banburys)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. or Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Provide enhanced general ventilation by mechanical means.(PROC6)
	Pressing uncured rubber blanks	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) recommended: Provide enhanced general ventilation by mechanical means.(PROC14)
	Vulcanisation Cooling cured articles	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Provide a good standard of controlled ventilation (5 to 10 air changes per hour)(PROC6)
	Laboratory activities	recommended: Handle in a fume cupboard or under extract ventilation.(PROC15)
	Spraying	Provide extract ventilation to points where emissions occur.(PROC7)
	Dipping, immersion and pouring	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.(PROC8a)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC21)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 4.19.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 4.19.v1	---	---	Maximum safe use per site	467000 kg/day	---
ESVOC SPERC 4.19.v1	---	Fresh water	PEC	0,197mg/l	0,290
ESVOC SPERC 4.19.v1	---	Fresh water sediment	PEC	1,03mg/kg wet weight	0,290
ESVOC SPERC 4.19.v1	---	Marine water	PEC	0,0197mg/l	0,0289
ESVOC SPERC 4.19.v1	---	Marine sediment	PEC	0,103mg/kg wet weight	0,0289
ESVOC SPERC 4.19.v1	---	Soil	PEC	0,966mg/kg wet weight	0,428
ESVOC SPERC 4.19.v1	---	Sewage treatment plant (STP)	PEC	1,96mg/l	0,144

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC9, PROC13, PROC14, PROC15, PROC21: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,03mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	0,14mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,2
PROC2	---	All routes	---	0,2
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC5	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC5	---	Inhalation worker exposure	35ppm	0,69
PROC5	---	All routes	---	0,72
PROC6	---	Dermal worker exposure	---	---
PROC6	---	Inhalation worker exposure	---	---
PROC6	---	All routes	---	---
PROC6	---	Dermal worker exposure	---	---
PROC6	---	Inhalation worker exposure	---	---
PROC6	---	All routes	---	---
PROC7	---	Dermal worker exposure	2,14mg/kg bw/day	0,01
PROC7	---	Inhalation worker exposure	25ppm	0,49
PROC7	---	All routes	---	0,50
PROC9	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC13	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC9	---	Inhalation worker exposure	35ppm	0,69
PROC9	---	All routes	---	0,71
PROC13	---	Inhalation worker exposure	15ppm	0,29
PROC13	---	All routes	---	0,33
PROC14	---	Dermal worker exposure	3,43mg/kg bw/day	0,01
PROC14	---	Inhalation worker exposure	15ppm	0,29

PROC14	---	All routes	---	0,30
PROC15	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,2
PROC15	---	All routes	---	0,2
PROC21	---	Dermal worker exposure	2,83mg/kg bw/day	0
PROC21	---	Inhalation worker exposure	0ppm	0
PROC21	---	All routes	---	0

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 5: Use in coatings	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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, pelletisation PROC15: Use as laboratory reagent
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 4.3a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	150000
	Fraction of EU tonnage used in region:	0,03
	Regional use tonnage (tons/year):	4500
	Fraction used at the main local source.	1
	Annual site tonnage	4500
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	98 %
	Emission or Release Factor: Water	0,7 %
	Emission or Release	0 %

	Factor: Soil	
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 90 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement)., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required. (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils., Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, 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 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems) Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing	recommended: Ensure material transfers are under containment or extract ventilation.(PROC2)
	Mixing operations	recommended: Ensure material transfers are under containment or extract ventilation.(PROC3)
	Film formation - air drying	recommended: Provide extract ventilation to points where emissions occur.

		Avoid manual contact with wet work pieces.(PROC4)
	Preparation of material for application	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Avoid manual contact with wet work pieces.(PROC5)
	Spraying (automatic/robotic)	Carry out in a vented booth or extracted enclosure. recommended: Carry out in a vented booth provided with laminar airflow.(PROC7)
	Spraying Manual	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC7)
	Material transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Provide extraction ventilation at points where emissions occur.(PROC8a, PROC8b)
	Roller, spreader, flow application	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Dipping, immersion and pouring	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Clear up spills immediately and dispose of waste safely. Avoid manual contact with wet work pieces.(PROC13)
	Laboratory activities	recommended: Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Handle in a fume cupboard or under extract ventilation.(PROC15)
	Material transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
	Production or preparation or articles by tabletting, compression, extrusion or pelletisation	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC14)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. recommended: Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Clear spills immediately.(PROC8a)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15)
	Spraying Manual	Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)
	Material transfers	recommended: Use suitable eye protection.(PROC9)
	Production or preparation or articles by tabletting, compression, extrusion or pelletisation	recommended: Use suitable eye protection.(PROC14)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 4.3a.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 4.3a.v1	---	Fresh water	PEC	0,344mg/l	0,505
ESVOC SPERC 4.3a.v1	---	Marine water	PEC	0,0343mg/l	0,0505
ESVOC SPERC 4.3a.v1	---	Fresh water sediment	PEC	1,8mg/kg wet weight	0,505
ESVOC SPERC 4.3a.v1	---	Marine sediment	PEC	0,18mg/kg wet weight	0,0505
ESVOC SPERC 4.3a.v1	---	Soil	PEC	1,7mg/kg wet weight	0,755
ESVOC SPERC 4.3a.v1	---	Sewage treatment plant (STP)	PEC	3,42mg/l	0,252
ESVOC SPERC 4.3a.v1	---	---	Maximum safe use per site	19900 kg/day	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,20
PROC2	---	All routes	---	0,20
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC5	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC5	---	Inhalation worker exposure	35ppm	0,69
PROC5	---	All routes	---	0,72
PROC7	---	Dermal worker exposure	2,14mg/kg bw/day	0,01
PROC7	---	Inhalation worker exposure	2,50ppm	0,05
PROC7	---	All routes	---	0,06

PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	---	Inhalation worker exposure	35ppm	0,69
PROC8a	---	All routes	---	0,72
PROC8b	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC8b	---	Inhalation worker exposure	35ppm	0,69
PROC8b	---	All routes	---	0,71
PROC9	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC9	---	Inhalation worker exposure	35ppm	0,69
PROC9	---	All routes	---	0,70
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	35ppm	0,69
PROC10	---	All routes	---	0,76
PROC13	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC13	---	Inhalation worker exposure	35ppm	0,69
PROC13	---	All routes	---	0,72
PROC14	---	Dermal worker exposure	3,43mg/kg bw/day	0,01
PROC14	---	Inhalation worker exposure	35ppm	0,69
PROC14	---	All routes	---	0,70
PROC15	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,20
PROC15	---	All routes	---	0,20
PROC7	Manual spraying	Dermal worker exposure	42,86mg/kg bw/day	0,11
PROC7	Manual spraying	Inhalation worker exposure	7,5ppm	0,15
PROC7	Manual spraying	All routes	---	0,26

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 6: Use 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 (e.g. Disinfectants, pest control) PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC9c: Finger paints PC15: Non-metal-surface treatment products PC18: Ink and toners PC23: Leather treatment products PC24: Lubricants, greases, release products PC31: Polishes and wax blends
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: **ERC8a**, **ERC8d**		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 8.3c.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	150000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	30
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98,5 %
	Emission or Release Factor: Water	1 %
	Emission or Release Factor: Soil	0,5 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Water	Risk from environmental exposure is driven by freshwater.
	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant

	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling consumer exposure for: PC4: Washing car window		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Exposure duration per day	0,02 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures., Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.3 Contributing scenario controlling consumer exposure for: PC4: Pouring into radiator		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2 kg
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures., Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.4 Contributing scenario controlling consumer exposure for: PC4: Lock de-icer		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	4 g
Frequency and duration of use	Exposure duration per event	0,25 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.5 Contributing scenario controlling consumer exposure for: PC8: Laundry and dish washing products		
(excipient only)		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Amount used	Amount used per event	15 g
Frequency and duration of use	Exposure duration per event	0,5 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.6 Contributing scenario controlling consumer exposure for: PC8: Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)		
(excipient only)		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
	Physical Form (at time of	liquid

	use)	
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	27 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	128 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

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

(excipient only)

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	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	128 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.8 Contributing scenario controlling consumer exposure for: PC9a: Waterborne latex wall paint

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Exposure duration per event	2,2 h
	Frequency of use	1 Times per day
	Frequency of use	4 days/year
Human factors not influenced by		

risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.9 Contributing scenario controlling consumer exposure for: PC9a: Solvent rich, high solid, water borne paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 2,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	744 g
Frequency and duration of use	Exposure duration per event	2,2 h
	Frequency of use	1 Times per day
	Frequency of use	6 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.10 Contributing scenario controlling consumer exposure for: PC9a: Removers (paint-, glue-, wall paper-, sealant-remover)		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 4%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	491 g
Frequency and duration of use	Exposure duration per event	2 h
	Frequency of use	1 Times per day
	Frequency of use	3 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.11 Contributing scenario controlling consumer exposure for: PC9b: Fillers and putty		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	85 g
Frequency and duration of use	Exposure duration per event	4 h
	Frequency of use	1 Times per day
	Frequency of use	12 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.12 Contributing scenario controlling consumer exposure for: PC9b: Plasters and floor equalizers		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	13,8 kg
Frequency and duration of use	Exposure duration per event	2 h
	Frequency of use	1 Times per day
	Frequency of use	12 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.13 Contributing scenario controlling consumer exposure for: PC9b: Modelling clay		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	

Amount used	Amount used per event	1 g
Frequency and duration of use	Exposure duration per event	1 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

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

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	1,35 g
Frequency and duration of use	Exposure duration per event	1 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

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

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Exposure duration per event	2,20 h
	Frequency of use	1 Times per day
	Frequency of use	4 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related	No specific risk management measure identified beyond those operational	

to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	conditions stated.	
2.16 Contributing scenario controlling consumer exposure for: PC15: Solvent rich, high solid, water borne paint		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	744 g
Frequency and duration of use	Exposure duration per event	2,20 h
	Frequency of use	1 Times per day
	Frequency of use	6 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.17 Contributing scenario controlling consumer exposure for: PC15: Aerosol spray can		
Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	215 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	2 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.18 Contributing scenario controlling consumer exposure for: PC15: Removers (paint-, glue-, wall paper-, sealant remover)		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	

Amount used	Amount used per event	491 g
Frequency and duration of use	Exposure duration per event	2 h
	Frequency of use	1 Times per day
	Frequency of use	3 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.19 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	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	40 g
Frequency and duration of use	Exposure duration per event	2,20 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

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

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	56 g
Frequency and duration of use	Exposure duration per event	1,23 h
	Frequency of use	1 Times per day
	Frequency of use	29 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related	No specific risk management measure identified beyond those operational	

to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	conditions stated.	

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

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	56 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	8 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.22 Contributing scenario controlling consumer exposure for: PC24: Liquids

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	4 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.23 Contributing scenario controlling consumer exposure for: PC24: Pastes

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa

	standard temperature and pressure	
Amount used	Amount used per event	34 g
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	10 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.24 Contributing scenario controlling consumer exposure for: PC24: Sprays		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	73 g
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	6 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	
2.25 Contributing scenario controlling consumer exposure for: PC31: Polishes, wax / cream (floor, furniture, shoes)		
Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	142 g
Frequency and duration of use	Exposure duration per event	1,23 h
	Frequency of use	1 Times per day
	Frequency of use	29 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers	Room size	20 m3

exposure	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

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

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	8 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.27 Contributing scenario controlling consumer exposure for: PC34

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5%.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	115 g
Frequency and duration of use	Exposure duration per event	1 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 8.3c.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 8.3c.v1	---	Fresh water	PEC	0,00409mg/l	0,00601
ESVOC SPERC 8.3c.v1	---	Marine water	PEC	0,000390mg/l	0,000574
ESVOC SPERC 8.3c.v1	---	Fresh water sediment	PEC	0,0214mg/kg wet weight	0,00601
ESVOC SPERC 8.3c.v1	---	Marine sediment	PEC	0,00204mg/kg wet weight	0,000574
ESVOC SPERC 8.3c.v1	---	Soil	PEC	0,0133mg/kg wet weight	0,00590
ESVOC SPERC 8.3c.v1	---	Sewage treatment plant (STP)	PEC	0,0268mg/l	0,00197
ESVOC SPERC 8.3c.v1	---	---	Maximum safe use per site	13600 kg/day	---

Consumers

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC4: Washing car window	---	consumer dermal, acute - systemic	0mg/kg/day	0
PC4: Washing car window	---	consumer oral, acute - systemic	0mg/kg/day	0
PC4: Washing car window	---	Consumer - inhalative, short-term - systemic	0,15mg/m³	0
PC4: Washing car window	---	Consumer - dermal, long-term - systemic	0mg/kg/day	0
PC4: Washing car window	---	consumer oral, long term - systemic	0mg/kg/day	0
PC4: Washing car window	---	Consumer - inhalative, long-term - systemic	0mg/m³	0
PC4: Pouring into radiator	---	consumer dermal, acute - systemic	6,18mg/kg/day	0,03
PC4: Pouring into radiator	---	consumer oral, acute - systemic	0mg/kg/day	0
PC4: Pouring into radiator	---	Consumer - inhalative, short-term - systemic	1,81mg/m³	0,03
PC4: Pouring into radiator	---	Consumer - dermal, long-term - systemic	6,18mg/kg/day	0,03
PC4: Pouring into radiator	---	consumer oral, long term - systemic	0mg/kg/day	0
PC4: Pouring into radiator	---	Consumer - inhalative, long-term - systemic	1,807mg/m³	0,03
PC4: Lock de-icer	---	consumer dermal, acute - systemic	15,49mg/kg/day	0,07
PC4: Lock de-icer	---	consumer oral, acute - systemic	0mg/kg/day	0
PC4: Lock de-icer	---	Consumer - inhalative, short-term - systemic	0,51mg/m³	0,01
PC4: Lock de-icer	---	Consumer - dermal, long-term - systemic	15,49mg/kg/day	0,07
PC4: Lock de-	---	consumer oral, long term	0mg/kg/day	0

icer		- systemic		
PC4: Lock de-icer	---	Consumer - inhalative, long-term - systemic	0,511mg/m³	0,01

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 7: Use in coatings	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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 ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 8.3b.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	150000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	30
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98 %
	Emission or Release Factor: Water	1 %
	Emission or Release Factor: Soil	1 %
	initial release prior to RMM, .	

Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
	Duration of the activity	<= 4 h(PROC5, PROC13)
	Duration of the activity	<= 15 min(PROC19)
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
	Indoor or outdoor use(PROC5, PROC13)	
Technical conditions and measures to control dispersion from source towards the worker	Filling/ preparation of equipment from drums or containers.	recommended: Provide extract ventilation to points where emissions occur.(PROC2)
	Preparation of material for application	recommended: Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Clear up spills immediately and dispose of waste safely.(PROC3)
	Film formation - air drying	Ensure operation is undertaken outdoors. recommended: Avoid manual contact with wet work pieces.(Outdoor PROC4)

	Film formation - air drying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) recommended: Provide extract ventilation to points where emissions occur. Avoid manual contact with wet work pieces.(Indoor PROC4)
	Preparation of material for application	Ensure operation is undertaken outdoors.(Outdoor PROC5)
	Preparation of material for application	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(Indoor PROC5)
	Material transfers	Use drum pumps or carefully pour from container. Provide local exhaust ventilation (LEV).(PROC8a, PROC8b)
	Roller, spreader, flow application	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(Indoor PROC10)
	Roller, spreader, flow application	Ensure operation is undertaken outdoors.(Outdoor PROC10)
	Spraying/ fogging by manual application	Carry out in a vented booth or extracted enclosure.(Indoor PROC11)
	Spraying/ fogging by manual application	Ensure operation is undertaken outdoors.(Outdoor PROC11)
	Dipping, immersion and pouring	Provide extract ventilation to points where emissions occur. recommended: Clear up spills immediately and dispose of waste safely. Avoid manual contact with wet work pieces.(Indoor PROC13)
	Dipping, immersion and pouring	Ensure operation is undertaken outdoors. recommended: Clear up spills immediately and dispose of waste safely. Avoid manual contact with wet work pieces.(Outdoor PROC13)
	Laboratory activities	recommended: Provide extract ventilation to points where emissions occur.(PROC15)
	hand-mixing with intimate contact and only ppe available	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Ensure doors and windows are opened.(Indoor PROC19)
	hand-mixing with intimate contact and only ppe available	Ensure operation is undertaken outdoors.(Outdoor PROC19)
Organisational measures to prevent /limit releases, dispersion and exposure	Preparation of material for application	Avoid carrying out operation for more than 4 hours.(Outdoor PROC5)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19)
	Roller, spreader, flow application	Wear a respirator conforming to EN140 with Type A filter or better.(Outdoor PROC10)
	Spraying/ fogging by	Wear a respirator conforming to EN140 with Type A

manual application	filter or better.(Outdoor PROC11)
Dipping, immersion and pouring	Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(Outdoor PROC13)
hand-mixing with intimate contact and only ppe available	Wear a respirator conforming to EN140 with Type A filter or better.(Outdoor PROC19)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 8.3b.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 8.3b.v1	---	---	Maximum safe use per site	12700 kg/day	---
ESVOC SPERC 8.3b.v1	---	Fresh water	PEC	0,00409mg/l	0,00601
ESVOC SPERC 8.3b.v1	---	Fresh water sediment	PEC	0,0214mg/kg wet weight	0,00601
ESVOC SPERC 8.3b.v1	---	Marine water	PEC	0,000390mg/l	0,000574
ESVOC SPERC 8.3b.v1	---	Marine sediment	PEC	0,00204mg/kg wet weight	0,000574
ESVOC SPERC 8.3b.v1	---	Soil	PEC	0,0146mg/kg wet weight	0,00645
ESVOC SPERC 8.3b.v1	---	Sewage treatment plant (STP)	PEC	0,0268mg/l	0,00197

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	20ppm	0,39
PROC2	---	All routes	---	0,40
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	Outdoor use	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	Outdoor use	Inhalation worker exposure	35ppm	0,69
PROC4	Outdoor use	All routes	---	0,70

PROC4	Indoor use	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	Indoor use	Inhalation worker exposure	15ppm	0,29
PROC4	Indoor use	All routes	---	0,31
PROC5	Indoor use	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC5	Indoor use	Inhalation worker exposure	30ppm	0,59
PROC5	Indoor use	All routes	---	0,63
PROC5	Outdoor use, during 1 - 4 hours	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC5	Outdoor use, during 1 - 4 hours	Inhalation worker exposure	42ppm	0,62
PROC5	Outdoor use, during 1 - 4 hours	All routes	---	0,68
PROC8a	Material transfers	Dermal worker exposure	1,37mg/kg bw/day	0
PROC8a	Material transfers	Inhalation worker exposure	20ppm	0,39
PROC8a	Material transfers	All routes	---	0,40
PROC8a	Equipment cleaning and maintenance	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	Equipment cleaning and maintenance	Inhalation worker exposure	20ppm	0,39
PROC8a	Equipment cleaning and maintenance	All routes	---	0,43
PROC8b	---	Dermal worker exposure	0,69mg/kg bw/day	0
PROC8b	---	Inhalation worker exposure	10ppm	0,20
PROC8b	---	All routes	---	0,20
PROC10	---	Dermal worker exposure	24,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	30ppm	0,59
PROC10	---	All routes	---	0,66
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	7ppm	0,14
PROC10	---	All routes	---	0,21
PROC11	Indoor use	Dermal worker exposure	2,14mg/kg bw/day	0,01
PROC11	Indoor use	Inhalation worker exposure	50ppm	0,98
PROC11	Indoor use	All routes	---	0,99
PROC11	Outdoor use, With respiratory protection	Dermal worker exposure	107,14mg/kg bw/day	0,28
PROC11	Outdoor use, With respiratory protection	Inhalation worker exposure	35ppm	0,69
PROC11	Outdoor use	All routes	---	0,97
PROC13	Indoor use	Dermal worker exposure	0,69mg/kg bw/day	0
PROC13	Indoor use	Inhalation worker exposure	20ppm	0,39
PROC13	Indoor use	All routes	---	0,39
PROC13	Outdoor use, With respiratory protection	Dermal worker exposure	13,71mg/kg bw/day	0,04

PROC13	Outdoor use, With respiratory protection	Inhalation worker exposure	7ppm	0,14
PROC13	Outdoor use, With respiratory protection	All routes	---	0,17
PROC15	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,20
PROC15	---	All routes	---	0,20
PROC19	With respiratory protection	All routes	---	0,51
PROC19	With respiratory protection	Inhalation worker exposure	7ppm	0,14
PROC19	With respiratory protection	Dermal worker exposure	141,43mg/kg bw/day	0,37
PROC19	---	All routes	---	0,96
PROC19	---	Inhalation worker exposure	30ppm	0,57
PROC19	---	Dermal worker exposure	141,43mg/kg bw/day	0,37

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 8: Use in cleaning agents	
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	PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping automated and by hand).

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	1500
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	30 %
	Emission or Release Factor: Water	0,003 %
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 70 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to

discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed., Do not apply industrial sludge to natural soils.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC2)
	Batch processes at elevated temperatures	Provide extraction ventilation at points where emissions occur.(PROC3, PROC4)
	Bulk transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
	Filling/ preparation of equipment from drums or containers.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Cleaning with high pressure washers	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC10)
	Cleaning with low-	Provide a good standard of general ventilation (not

	pressure washers	less than 3 to 5 air changes per hour).(PROC10)
	Degreasing small objects in cleaning station	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 4.4a.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 4.4a.v1	---	---	Maximum safe use per site	1770000 kg/day	---
ESVOC SPERC 4.4a.v1	---	Fresh water	PEC	0,00192mg/l	0,00283
ESVOC SPERC 4.4a.v1	---	Fresh water sediment	PEC	0,0101mg/kg wet weight	0,00283
ESVOC SPERC 4.4a.v1	---	Marine water	PEC	0,000174mg/l	0,000255
ESVOC SPERC 4.4a.v1	---	Marine sediment	PEC	0,000909mg/kg wet weight	0,000255
ESVOC SPERC 4.4a.v1	---	Soil	PEC	0,00443mg/kg wet weight	0,00174
ESVOC SPERC 4.4a.v1	---	Sewage treatment plant (STP)	PEC	0,00489mg/l	0,000359

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 9: Use in cleaning agents	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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 ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping automated and by hand).

2.1 Contributing scenario controlling environmental exposure for: **ERC8a**, **ERC8d**		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 8.4b.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	3
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	2 %
	Emission or Release Factor: Water	0 %
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: > 0 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to

releases to soil Organizational measures to prevent/limit release from the site		provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils., Soil emission controls are not applicable as there is no direct release to soil.
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
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 controlled ventilation (10 to 15 air changes per hour) recommended: Use drum pumps or carefully pour from container.(PROC8a)
	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Filling/ preparation of equipment from drums or containers.	Ensure operation is undertaken outdoors.(PROC8a)
	Manual	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Cleaning with low-pressure washers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)

	Cleaning with high pressure washers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC11)
	Manual	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.(PROC10)
	Ad hoc manual application via trigger sprays, dipping, etc.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Application of cleaning products in closed systems	Ensure operation is undertaken outdoors.(PROC4)
	Cleaning of medical devices	Provide extract ventilation to points where emissions occur.(PROC4)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. recommended: Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Clear spills immediately.(PROC8a)
	Ad hoc manual application via trigger sprays, dipping, etc.	Provide extract ventilation to points where emissions occur.(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	Filling/ preparation of equipment from drums or containers.	Avoid carrying out operation for more than 4 hours.(PROC8a)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13)
	Cleaning with low-pressure washers	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Cleaning with high pressure washers	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Manual	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Ad hoc manual application via trigger sprays, dipping, etc.	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 8.4b.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 8.4b.v1	---	---	Maximum safe use per site	3900 kg/day	---
ESVOC SPERC 8.4b.v1	---	---	PEC	0,00141mg/l	0,00207
ESVOC SPERC 8.4b.v1	---	---	PEC	0,00738mg/kg wet weight	0,00207

ESVOC SPERC 8.4b.v1	---	---	PEC	0,000123mg/kg wet weight	0,000180
ESVOC SPERC 8.4b.v1	---	---	PEC	0,000642mg/l	0,000180
ESVOC SPERC 8.4b.v1	---	---	PEC	0,000145mg/kg wet weight	< 0,00001
ESVOC SPERC 8.4b.v1	---	---	PEC	0,0000268mg/l	< 0,00001

Workers

PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	20ppm	0,39
PROC2	---	All routes	---	0,40
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	35ppm	0,69
PROC4	---	All routes	---	0,70
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	---	Inhalation worker exposure	42ppm	0,82
PROC8a	---	All routes	---	0,86
PROC8b	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC8b	---	Inhalation worker exposure	15ppm	0,29
PROC8b	---	All routes	---	0,31
PROC10	Ad hoc manual application via trigger sprays, dipping, etc., With Local Exhaust Ventilation	Dermal worker exposure	1,37mg/kg bw/day	0
PROC10	Ad hoc manual application via trigger sprays, dipping, etc., With Local Exhaust Ventilation	Inhalation worker exposure	20ppm	0,39
PROC10	Ad hoc manual application via trigger sprays, dipping, etc., With Local Exhaust Ventilation	All routes	---	0,40
PROC11	---	Dermal worker exposure	107,4mg/kg bw/day	0,28
PROC11	---	Inhalation worker exposure	35ppm	0,69
PROC11	---	All routes	---	0,97

PROC13	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC13	---	Inhalation worker exposure	30ppm	0,59
PROC13	---	All routes	---	0,62
PROC8a	Equipment cleaning and maintenance	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	Equipment cleaning and maintenance	Inhalation worker exposure	20ppm	0,39
PROC8a	Equipment cleaning and maintenance	All routes	---	0,43
---	Ad hoc manual application via trigger sprays, dipping, etc., With respiratory protection	Dermal worker exposure	27,43mg/kg bw/day	0,07
---	Ad hoc manual application via trigger sprays, dipping, etc., With respiratory protection	Inhalation worker exposure	7ppm	0,14
---	Ad hoc manual application via trigger sprays, dipping, etc., With respiratory protection	All routes	---	0,21

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 10: Use in binder and release agents	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC6: Calendering operations PROC7: Industrial spraying PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC5: Industrial use resulting in inclusion into or onto a matrix
Activity	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC5		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 4.10a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction used at the main local source.	1
	Annual site tonnage	1500
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	100 %
	Emission or Release Factor: Water	0,003 %
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: > 80 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal

discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		efficiency of (%): (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils., Soil emission controls are not applicable as there is no direct release to soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Material transfers	recommended: Clear transfer lines prior to de-coupling. Transfer via enclosed lines.(PROC1, PROC2, PROC3)
	Mixing operations (open systems)	recommended: Provide extract ventilation to points where emissions occur.(PROC4)
	Mixing operations	recommended: Provide extract ventilation to points where emissions occur.(PROC3)
	Mold forming	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Production or preparation or articles by tabletting, compression, extrusion or pelletisation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Calendering (including Banburys)	Provide extract ventilation to points where emissions occur.(PROC6)
	Spraying/fogging by machine application	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. recommended:

		Automate activity where possible.(PROC7)
	Manual Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Spraying/ fogging by manual application	Carry out in a vented booth or extracted enclosure.(PROC7)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	Spraying/ fogging by manual application	recommended: Segregate the activity away from other operations. Ensure operatives are trained to minimise exposures.(PROC7)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14)
	Storage	Use suitable eye protection.(PROC1, PROC2)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 4.10a.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 4.10a.v1	---	Fresh water	PEC	0,0019mg/l	0,00279
ESVOC SPERC 4.10a.v1	---	Marine water	PEC	0,000171mg/l	0,000252
ESVOC SPERC 4.10a.v1	---	Fresh water sediment	PEC	0,00993mg/kg wet weight	0,00279
ESVOC SPERC 4.10a.v1	---	Marine sediment	PEC	0,000897mg/kg wet weight	0,000252
ESVOC SPERC 4.10a.v1	---	Soil	PEC	0,0152mg/kg wet weight	0,00671
ESVOC SPERC 4.10a.v1	---	Sewage treatment plant (STP)	PEC	0,00489mg/l	0,000359
ESVOC SPERC 4.10a.v1	---	---	Maximum safe use per site	744000 kg/day	---

Workers

PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC10, PROC13, PROC14: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,2
PROC2	---	All routes	---	0,2
PROC1	Material transfers	Dermal worker exposure	0,03mg/kg bw/day	0
PROC1	Material transfers	Inhalation worker	0,01ppm	0

		exposure		
PROC1	Material transfers	All routes	---	0
PROC2	Material transfers	Dermal worker exposure	0,14mg/kg bw/day	0
PROC2	Material transfers	Inhalation worker exposure	10ppm	0,2
PROC2	Material transfers	All routes	---	0,2
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC6	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC6	---	Inhalation worker exposure	25ppm	0,49
PROC6	---	All routes	---	0,49
PROC7	Spraying, Machines	Dermal worker exposure	2,14mg/kg bw/day	0,01
PROC7	Spraying, Machines	Inhalation worker exposure	12,5ppm	0,25
PROC7	Spraying, Machines	All routes	---	0,25
PROC7	Spraying, Manual	Dermal worker exposure	42,86mg/kg bw/day	0,11
PROC7	Spraying, Manual	Inhalation worker exposure	2,50ppm	0,05
PROC7	Spraying, Manual	All routes	---	0,16
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	15ppm	0,29
PROC10	---	All routes	---	0,37
PROC13	---	Dermal worker exposure	13,31mg/kg bw/day	0,03
PROC13	---	Inhalation worker exposure	15ppm	0,29
PROC13	---	All routes	---	0,33
PROC14	---	Dermal worker exposure	3,43mg/kg bw/day	0,01
PROC14	---	Inhalation worker exposure	15ppm	0,29
PROC14	---	All routes	---	0,30

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

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

are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 11: Use in binder and release agents	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises 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 PROC10: Roller application or brushing PROC11: Non industrial spraying PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 8.10b.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	3
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	2,5 %
	Emission or Release Factor: Soil	2,5 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 93,3

releases to soil Organizational measures to prevent/limit release from the site		%)
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Human factors not influenced by risk management	Assumes a good basic standard of occupational hygiene is implemented.	
Technical conditions and measures to control dispersion from source towards the worker	Material transfers Closed systems	recommended: Clear transfer lines prior to de-coupling. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC2, PROC3)
	Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a)
	Drum/batch transfers	Transfer materials directly to mixing vessels.(PROC8b)
	Mixing operations (open systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Mold forming	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Casting operations Open systems	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC6)
	Spraying/ fogging by manual application	Carry out in a vented booth or extracted enclosure. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC11)
	Spraying/fogging by machine application	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC11)
	Manual Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
Conditions and measures related	General exposures	recommended:

to personal protection, hygiene and health evaluation		Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14)
	Spraying/fogging by machine application	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 8.10b.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 8.10b.v1	---	---	Maximum safe use per site	2660 kg/day	---
ESVOC SPERC 8.10b.v1	---	Fresh water	PEC	0,00208mg/l	0,00305
ESVOC SPERC 8.10b.v1	---	Fresh water sediment	PEC	0,0109mg/kg wet weight	0,00305
ESVOC SPERC 8.10b.v1	---	Marine water	PEC	0,000189mg/l	0,000278
ESVOC SPERC 8.10b.v1	---	Marine sediment	PEC	0,000992mg/kg wet weight	0,000278
ESVOC SPERC 8.10b.v1	---	Soil	PEC	0,00355mg/kg wet weight	0,00157
ESVOC SPERC 8.10b.v1	---	Sewage treatment plant (STP)	PEC	0,00670mg/l	0,000492

Workers

PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	Storage	Dermal worker exposure	0,03mg/kg bw/day	0
PROC1	Storage	Inhalation worker exposure	0,01ppm	0
PROC1	Storage	All routes	---	0
PROC1	Material transfers	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	Material transfers	Inhalation worker exposure	0,01ppm	0
PROC1	Material transfers	All routes	---	0
PROC2	Material transfers	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	Material transfers	Inhalation worker exposure	20ppm	0,39
PROC2	Material transfers	All routes	---	0,40
PROC2	Storage	Dermal worker exposure	0,14mg/kg bw/day	0
PROC2	Storage	Inhalation worker exposure	20ppm	0,39
PROC2	Storage	All routes	---	0,39
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49

PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	35ppm	0,69
PROC4	---	All routes	---	0,71
PROC6	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC6	---	Inhalation worker exposure	30ppm	0,59
PROC6	---	All routes	---	0,66
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	---	Inhalation worker exposure	30ppm	0,59
PROC8a	---	All routes	---	0,63
PROC8b	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC8b	---	Inhalation worker exposure	30ppm	0,59
PROC8b	---	All routes	---	0,61
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	30ppm	0,59
PROC10	---	All routes	---	0,66
PROC11	Spraying, Machines	Dermal worker exposure	2,14mg/kg bw/day	0,01
PROC11	Spraying, Machines	Inhalation worker exposure	30ppm	0,59
PROC11	---	All routes	---	---
PROC11	Spraying, Manual	Dermal worker exposure	107,14mg/kg bw/day	0,28
PROC11	Spraying, Manual	Inhalation worker exposure	35ppm	0,69
PROC11	Spraying, Manual	All routes	---	0,97
PROC14	---	Dermal worker exposure	3,43mg/kg bw/day	0,01
PROC14	---	Inhalation worker exposure	30ppm	0,59
PROC14	---	All routes	---	0,60

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 12: Use in fuel	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC7		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 7.12a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	150000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	15000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,25 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: > 95 %)
	Soil	Soil emission controls are not applicable as there is no direct release to soil.
	Water	Treat onsite wastewater (prior to receiving water

releases to soil Organizational measures to prevent/limit release from the site		discharge) to provide the required removal efficiency of (%):, Risk from environmental exposure is driven by freshwater. (Degradation effectiveness: 93,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers	recommended: Clear transfer lines prior to de-coupling. Provide extract ventilation to points where emissions occur. or Ensure operation is undertaken outdoors.(PROC4)
	Drum/batch transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Avoid spillage when withdrawing pump.(PROC8b)
	General exposures	recommended: Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC3)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. recommended: Transfer via enclosed lines. Apply vessel entry procedures including use of forced supplied air. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Vessel and container cleaning	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

		recommended: Transfer via enclosed lines. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Avoid dip sampling.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16)
	Equipment cleaning and maintenance	Wear suitable coveralls to prevent exposure to the skin.(PROC8a)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 7.12a.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 7.12a.v1	---	---	Maximum safe use per site	11000000 kg/day	---
ESVOC SPERC 7.12a.v1	---	Fresh water	PEC	0,00306mg/l	0,00451
ESVOC SPERC 7.12a.v1	---	Fresh water sediment	PEC	0,0161mg/kg wet weight	0,00451
ESVOC SPERC 7.12a.v1	---	Marine water	PEC	0,000288mg/l	0,000423
ESVOC SPERC 7.12a.v1	---	Marine sediment	PEC	0,00151mg/kg wet weight	0,000423
ESVOC SPERC 7.12a.v1	---	Soil	PEC	0,00974mg/kg wet weight	0,00382
ESVOC SPERC 7.12a.v1	---	Sewage treatment plant (STP)	PEC	0,0163mg/l	0,00102

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,03mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,2
PROC2	---	All routes	---	0,2
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39

PROC4	---	All routes	---	0,41
PROC8a	Equipment cleaning and maintenance	Dermal worker exposure	2,74mg/kg bw/day	0,01
PROC8a	Equipment cleaning and maintenance	Inhalation worker exposure	10ppm	0,2
PROC8a	Equipment cleaning and maintenance	All routes	---	0,21
PROC8a	Cleaning	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	Cleaning	Inhalation worker exposure	35ppm	0,69
PROC8a	Cleaning	All routes	---	0,72
PROC8b	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC8b	---	Inhalation worker exposure	35ppm	0,69
PROC8b	---	All routes	---	0,71
PROC16	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC16	---	Inhalation worker exposure	5ppm	0,10
PROC16	---	All routes	---	0,1

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 13: Use in fuel	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 9.12b.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	150000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	30
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0,001 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Soil	Do not apply industrial sludge to natural soils., Soil emission controls are not applicable as there is no

		direct release to soil.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC4)
	Drum/batch transfers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Avoid spillage when withdrawing pump.(PROC8b)
	Dipping, immersion and pouring	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). recommended: Avoid spillage when withdrawing pump.(PROC8b)
	General exposures	Handle substance within a closed system.(PROC16)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. recommended: Transfer via enclosed lines. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Vessel and container cleaning	Drain down and flush system prior to equipment opening or maintenance. recommended: Apply vessel entry procedures including use of forced supplied air. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 9.12b.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 9.12b.v1	---	---	Maximum safe use per site	3900 kg/day	---
ESVOC SPERC 9.12b.v1	---	Fresh water	PEC	0,00141mg/l	0,00207
ESVOC SPERC 9.12b.v1	---	Fresh water sediment	PEC	0,00738mg/kg wet weight	0,00207
ESVOC SPERC 9.12b.v1	---	Marine water	PEC	0,000123mg/l	0,000180
ESVOC SPERC 9.12b.v1	---	Marine sediment	PEC	0,000642mg/kg wet weight	0,000180
ESVOC SPERC 9.12b.v1	---	Soil	PEC	0,000144mg/kg wet weight	< 0,0001
ESVOC SPERC 9.12b.v1	---	Sewage treatment plant (STP)	PEC	0,0000268mg/l	< 0,0001

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	20ppm	0,39
PROC2	---	All routes	---	0,40
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	15ppm	0,29
PROC4	---	All routes	---	0,31
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	---	Inhalation worker exposure	20ppm	0,39
PROC8a	---	All routes	---	0,43
PROC8b	---	Dermal worker exposure	3,43mg/kg bw/day	0,01
PROC8b	---	Inhalation worker exposure	35ppm	0,69
PROC8b	---	All routes	---	0,7

PROC16	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC16	---	Inhalation worker exposure	10ppm	0,2
PROC16	---	All routes	---	0,2

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 14: Use as Functional Fluids	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.

2.1 Contributing scenario controlling environmental exposure for: ERC7		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 7.13a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	1500
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	0,03 %
	Emission or Release Factor: Soil	0,1 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit	Soil	Do not apply industrial sludge to natural soils., Risk from environmental exposure is driven by soil.
	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)

discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed., Do not apply industrial sludge to natural soils.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers	recommended: Clear lines prior to de-coupling.(PROC1, PROC2, PROC3, PROC4)
	Drum/batch transfers	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC8b)
	Pelletizing Closed systems	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC9)
	Filling/ preparation of equipment from drums or containers.	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. recommended: Carefully pour from containers.(PROC8a)
	General exposures (closed systems)	recommended: Handle substance within a predominantly closed system provided with extract ventilation.(PROC2)
	General exposures (open systems)	recommended: Provide extract ventilation to points where emissions occur.(PROC4)

	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. recommended: Retain drain downs in sealed storage pending disposal or for subsequent recycle. Transfer via enclosed lines.(PROC8a)
	Remanufacture of reject articles	Drain down system prior to equipment break-in or maintenance. recommended: Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Storage	recommended: Ensure material transfers are under containment or extract ventilation.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 7.13a.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 7.13a.v1	---	---	Maximum safe use per site	455000 kg/day	---
ESVOC SPERC 7.13a.v1	---	Fresh water	PEC	0,00632mg/l	0,00930
ESVOC SPERC 7.13a.v1	---	Fresh water sediment	PEC	0,0331mg/kg wet weight	0,00930
ESVOC SPERC 7.13a.v1	---	Marine water	PEC	0,000614mg/l	0,000902
ESVOC SPERC 7.13a.v1	---	Marine sediment	PEC	0,00321mg/kg wet weight	0,000902
ESVOC SPERC 7.13a.v1	---	Soil	PEC	0,0248mg/kg wet weight	0,00974
ESVOC SPERC 7.13a.v1	---	Sewage treatment plant (STP)	PEC	0,0489mg/l	0,00359

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,03mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	0,14mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,20
PROC2	---	All routes	---	0,2
PROC3	---	Dermal worker exposure	0,03mg/kg bw/day	0

PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC8a	Filling/ preparation of equipment from drums or containers.	Dermal worker exposure	1,37mg/kg bw/day	0
PROC8a	Filling/ preparation of equipment from drums or containers.	Inhalation worker exposure	5ppm	0,1
PROC8a	Filling/ preparation of equipment from drums or containers.	All routes	---	0,1
PROC8a	Equipment cleaning and maintenance	Dermal worker exposure	0,14mg/kg bw/day	0
PROC8a	Equipment cleaning and maintenance	Inhalation worker exposure	10ppm	0,2
PROC8a	Equipment cleaning and maintenance	All routes	---	0,2
PROC8b	---	Dermal worker exposure	0,69mg/kg bw/day	0
PROC8b	---	Inhalation worker exposure	1,5ppm	0,03
PROC8b	---	All routes	---	0,03
PROC9	Pelletizing	Dermal worker exposure	0,69mg/kg bw/day	0
PROC9	Pelletizing	Inhalation worker exposure	5ppm	0,10
PROC9	Pelletizing	All routes	---	0,10
PROC9	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC9	---	Inhalation worker exposure	10ppm	0,20
PROC9	---	All routes	---	0,22

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 15: Use as Functional Fluids		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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 ERC9b: Wide dispersive outdoor use of substances in closed systems	
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.	
2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 9.13b.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	3
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	5 %
	Emission or Release Factor: Water	2,5 %
	Emission or Release Factor: Soil	2,5 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal., Risk from environmental exposure is driven by freshwater., Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Air	Treat air emission to provide a typical removal

		efficiency of (%): (Efficiency: 0 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers	Use drum pumps or carefully pour from container. recommended: Ensure material transfers are under containment or extract ventilation. Avoid spillage when withdrawing pump.(PROC8a)
	Transfer from/pouring from containers	Use drum pumps or carefully pour from container. recommended: Ensure material transfers are under containment or extract ventilation. Avoid spillage when withdrawing pump.(PROC9)
	Filling/ preparation of equipment from drums or containers.	Use drum pumps or carefully pour from container. recommended: Ensure material transfers are under containment or extract ventilation. Avoid spillage when withdrawing pump.(PROC9)
	General exposures (closed systems)	recommended: Handle substance within a predominantly closed system provided with extract ventilation.(PROC1, PROC2)
	General exposures (open systems)	Handle substance within a predominantly closed system provided with extract ventilation.(PROC20)
	Remanufacture of reject articles	Drain down system prior to equipment break-in or maintenance. recommended:

		Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance. recommended: Provide enhanced general ventilation by mechanical means. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 9.13b.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 9.13b.v1	---	---	Maximum safe use per site	2660 kg/day	---
ESVOC SPERC 9.13b.v1	---	---	PEC	0,00208mg/l	0,00305
ESVOC SPERC 9.13b.v1	---	---	PEC	0,0109mg/kg wet weight	0,00305
ESVOC SPERC 9.13b.v1	---	---	PEC	0,000189mg/kg wet weight	0,000278
ESVOC SPERC 9.13b.v1	---	---	PEC	0,000992mg/l	0,000278
ESVOC SPERC 9.13b.v1	---	---	PEC	0,00343mg/kg wet weight	0,00152
ESVOC SPERC 9.13b.v1	---	---	PEC	0,00670mg/l	0,000492

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

Workers

PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	Storage	Dermal worker exposure	0,03mg/kg bw/day	0
PROC1	Storage	Inhalation worker exposure	0,01ppm	0
PROC1	Storage	All routes	---	0
PROC1	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	Storage	Dermal worker exposure	0,14mg/kg bw/day	0
PROC2	Storage	Inhalation worker exposure	20ppm	0,39
PROC2	Storage	All routes	---	0,39
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0

PROC2	---	Inhalation worker exposure	20ppm	0,39
PROC2	---	All routes	---	0,4
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC8a	Drum/batch transfers	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	Drum/batch transfers	Inhalation worker exposure	20ppm	0,39
PROC8a	Drum/batch transfers	All routes	---	0,43
PROC8a	Equipment cleaning and maintenance	Dermal worker exposure	0,14mg/kg bw/day	0
PROC8a	Equipment cleaning and maintenance	Inhalation worker exposure	20ppm	0,39
PROC8a	Equipment cleaning and maintenance	All routes	---	0,39
PROC9	Transfer from/pouring from containers, Filling/ preparation of equipment from drums or containers.	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC9	Transfer from/pouring from containers, Filling/ preparation of equipment from drums or containers.	Inhalation worker exposure	20ppm	0,39
PROC9	Transfer from/pouring from containers, Filling/ preparation of equipment from drums or containers.	All routes	---	0,41
PROC9	Remanufacture of reject articles	All routes	---	0,39
PROC9	Remanufacture of reject articles	Dermal worker exposure	0,69mg/kg bw/day	0
PROC9	Remanufacture of reject articles	Inhalation worker exposure	20ppm	0,39
PROC20	---	All routes	---	0,2
PROC20	---	Inhalation worker exposure	10ppm	0,2
PROC20	---	Dermal worker exposure	0,17mg/kg bw/day	0

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 16: 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	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
Activity	Use of the substance within laboratory settings, including material transfers and equipment cleaning	
2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4		
Substance is a unique structure, Readily biodegradable.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	1500
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Continuous use/release	
	Number of emission days per year	300
	Emission or Release Factor: Air	2,5 %
	Emission or Release Factor: Water	2,0 %
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 93,3 %)
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	Cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) recommended: Use long handled tools where possible. Carefully pour from containers.(PROC10)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC10, PROC15)

3. Exposure estimation and reference to its source

Environment

ERC2: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	---	Maximum safe use per site	7020 kg/day	---
ERC2	---	Fresh water	PEC	0,327mg/l	0,481
ERC2	---	Fresh water sediment	PEC	1,71mg/kg wet weight	0,481
ERC2	---	Marine water	PEC	0,0327mg/l	0,0481
ERC2	---	Marine sediment	PEC	0,171mg/kg wet weight	0,0481
ERC2	---	Soil	PEC	1,61mg/kg wet weight	0,712
ERC2	---	Sewage treatment plant (STP)	PEC	3,26mg/l	0,240

Workers

PROC10, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	15ppm	0,29
PROC10	---	All routes	---	0,37

PROC15	---	Dermal worker exposure	0,03mg/kg bw/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,2
PROC15	---	All routes	---	0,2

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 17: 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 ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Activity	Use of small quantities within laboratory settings, including material transfers and equipment cleaning	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 8.17.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	15000
	Regional use tonnage (tons/year):	1500
	Fraction of EU tonnage used in region:	0,1
	Fraction used at the main local source.	0,002
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	50 %
	Emission or Release Factor: Water	50 %
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: > 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 93,3 %)
	Soil	Soil emission controls are not applicable as there is no direct release to soil., Do not apply industrial sludge to natural soils.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related	Recovery Methods	External recovery and recycling of waste should

to external recovery of waste		comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	Cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) recommended: Use long handled tools where possible. Carefully pour from containers.(PROC10)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC10, PROC15)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 8.17.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 8.17.v1	---	---	Maximum safe use per site	280 kg/day	---
ESVOC SPERC 8.17.v1	---	Fresh water	PEC	0,0148mg/l	0,0218
ESVOC SPERC 8.17.v1	---	Fresh water sediment	PEC	0,00146mg/kg wet weight	0,0218
ESVOC SPERC 8.17.v1	---	Marine water	PEC	0,0775mg/l	0,00215
ESVOC SPERC 8.17.v1	---	Marine sediment	PEC	0,00766mg/kg wet weight	0,00215
ESVOC SPERC 8.17.v1	---	Soil	PEC	0,0662mg/kg wet weight	0,0293
ESVOC SPERC 8.17.v1	---	Sewage treatment plant (STP)	PEC	0,134mg/l	0,00985

Workers

PROC10, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07
PROC10	---	Inhalation worker exposure	30ppm	0,59

PROC10	---	All routes	---	0,66
PROC15	---	Dermal worker exposure	0,03mg/kg bw/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,2
PROC15	---	All routes	---	0,2

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 18: 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	
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)	
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
Activity	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Substance is a unique structure, Readily biodegradable.		
Amount used	Amounts used in the EU (tonnes/year)	30000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	3000
	Fraction used at the main local source.	1
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Discharge to the aquatic environment is restricted by the Water Framework Directive
	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b		
Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 100 %.

	Mixture/Article	
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers Filling/ preparation of equipment from drums or containers.	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8b)
	Drill floor operations	Ensure operation is undertaken outdoors.(PROC3, PROC4)
	Operation of solids filtering equipment - vapour exposures	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Operation of solids filtering equipment - aerosol exposures	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Operation of solids filtering equipment	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
	Pouring from small containers	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
	General exposures (open systems)	Ensure operation is undertaken outdoors.(PROC4)
	Equipment cleaning and maintenance	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
	Batch process	Provide extract ventilation to points where emissions occur.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b)

3. Exposure estimation and reference to its source

Environment

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

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0
PROC2	---	Inhalation worker exposure	10ppm	0,20
PROC2	---	All routes	---	0,2

PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	Outdoor use	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	Outdoor use	Inhalation worker exposure	14ppm	0,27
PROC4	Outdoor use	All routes	---	0,29
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	---	Inhalation worker exposure	35ppm	0,69
PROC8a	---	All routes	---	0,72
PROC8b	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC8b	---	Inhalation worker exposure	35ppm	0,69
PROC8b	---	All routes	---	0,70

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

Environment
No exposure assessment presented for the environment.
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 19: Use as an intermediate		
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: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
Activity	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
2.1 Contributing scenario controlling environmental exposure for: ERC6a		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 6.1a.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	120000
	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	12000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage	12000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,2 %
	Emission or Release Factor: Water	0,3 %
	Emission or Release Factor: Soil	0,1 %
	initial release prior to RMM, .	
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 80 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to

discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site		provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils., Risk from environmental exposure is driven by soil.
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Laboratory activities	recommended: Handle in a fume cupboard or under extract ventilation.(PROC15)
	Storage	recommended: Avoid dip sampling. Provide extract ventilation to material transfer points and other openings.(PROC2)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. recommended: Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Provide extract ventilation to points where emissions occur. Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Process sampling	recommended: Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	Bulk transfers	recommended:

	Open systems Closed systems	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Clear transfer lines prior to de-coupling.(PROC8b)
	General exposures (closed systems)	recommended: Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC3)
Organisational measures to prevent /limit releases, dispersion and exposure	Process sampling	Ensure operatives are trained to minimise exposures.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15)

3. Exposure estimation and reference to its source

Environment

ESVOC SPERC 6.1a.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 6.1a.v1	---	---	Maximum safe use per site	45600 kg/day	---
ESVOC SPERC 6.1a.v1	---	Fresh water	PEC	0,403mg/l	0,593
ESVOC SPERC 6.1a.v1	---	Fresh water sediment	PEC	2,11mg/kg wet weight	0,593
ESVOC SPERC 6.1a.v1	---	Marine water	PEC	0,0403mg/l	0,0593
ESVOC SPERC 6.1a.v1	---	Marine sediment	PEC	0,211mg/kg wet weight	0,0593
ESVOC SPERC 6.1a.v1	---	Soil	PEC	1,98mg/kg wet weight	0,777
ESVOC SPERC 6.1a.v1	---	Sewage treatment plant (STP)	PEC	4,02mg/l	0,295

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC1	---	Inhalation worker exposure	0,01ppm	0
PROC1	---	All routes	---	0
PROC2	---	Dermal worker exposure	1,37mg/kg bw/day	0,0
PROC2	---	Inhalation worker exposure	10ppm	0,2
PROC2	---	All routes	---	0,2
PROC3	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC3	---	Inhalation worker exposure	25ppm	0,49
PROC3	---	All routes	---	0,49
PROC4	---	Dermal worker exposure	6,86mg/kg bw/day	0,02

PROC4	---	Inhalation worker exposure	20ppm	0,39
PROC4	---	All routes	---	0,41
PROC8a	---	Dermal worker exposure	0,14mg/kg bw/day	0
PROC8a	---	Inhalation worker exposure	10ppm	0,20
PROC8a	---	All routes	---	0,20
PROC8b	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC8b	---	Inhalation worker exposure	15ppm	0,29
PROC8b	---	All routes	---	0,31
PROC15	---	Dermal worker exposure	0,34mg/kg bw/day	0
PROC15	---	Inhalation worker exposure	10ppm	0,20
PROC15	---	All routes	---	0,20

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

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

1. Short title of Exposure Scenario 20: Use in road and construction applications	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Activity	Covers the use of formulation in the building and construction material transfers, application by rolling, brushing, wiping, tabletting, compression, cutting, drilling, equipment cleaning

2.1 Contributing scenario controlling environmental exposure for: ERC8d, ERC8f		
Substance is a unique structure, Readily biodegradable. , ESVOC spERC 8.15.v1 has been used to evaluate the exposure for the environment.		
Amount used	Amounts used in the EU (tonnes/year)	30000
	Regional use tonnage (tons/year):	3000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage	60
	Fraction of EU tonnage used in region:	0,1
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	1 %
	Emission or Release Factor: Soil	4 %
Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: > 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d

	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers Non-dedicated facility	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a)
	Drum/batch transfers Dedicated facility	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Material transfers	Ensure operation is undertaken outdoors.(PROC9)
	Rolling, Brushing Manual	Ensure operation is undertaken outdoors. recommended: Use long handled brushes and rollers.(PROC10)
	Spraying/fogging by machine application	Ensure operation is undertaken outdoors. Automate activity where possible.(PROC11)
	Dipping, immersion and pouring	Ensure operation is undertaken outdoors. recommended: Use long handled tools where possible.(PROC13)
	Equipment cleaning and maintenance	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
Organisational measures to prevent /limit releases, dispersion and exposure	Material transfers	Avoid carrying out operation for more than 4 hours.(PROC9)
	Spraying/fogging by machine application	Ensure operatives are trained to minimise exposures. Avoid carrying out operation for more than 1 hour.(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	General exposures	recommended: Wear suitable gloves tested to EN374.(PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13)
	Rolling, Brushing Manual	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Spraying/fogging by machine application	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
3. Exposure estimation and reference to its source		

Environment

ESVOC SPERC 8.15.v1: EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SPERC 8.15.v1	---	---	Maximum safe use per site	6000 kg/day	---
ESVOC SPERC 8.15.v1	---	Fresh water	PEC	0,00194mg/l	0,00286
ESVOC SPERC 8.15.v1	---	Fresh water sediment	PEC	0,0102mg/kg wet weight	0,00286
ESVOC SPERC 8.15.v1	---	Marine water	PEC	0,000176mg/l	0,000259
ESVOC SPERC 8.15.v1	---	Marine sediment	PEC	0,000921mg/kg wet weight	0,000259
ESVOC SPERC 8.15.v1	---	Soil	PEC	0,00301mg/kg wet weight	0,00133
ESVOC SPERC 8.15.v1	---	Sewage treatment plant (STP)	PEC	0,00536mg/l	0,000394

Workers

PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13: ECETOC TRA model v2

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Dermal worker exposure	0,03mg/kg bw/day	0
PROC8a	---	Inhalation worker exposure	30ppm	0,59
PROC8a	---	All routes	---	0,59
PROC8b	---	Dermal worker exposure	0,69mg/kg bw/day	0
PROC8b	---	Inhalation worker exposure	25ppm	0,49
PROC8b	---	All routes	---	0,49
PROC9	---	Dermal worker exposure	6,86mg/kg bw/day	0,02
PROC9	---	Inhalation worker exposure	42ppm	0,82
PROC9	---	All routes	---	0,84
PROC11	---	Dermal worker exposure	107,14mg/kg bw/day	0,28
PROC11	---	Inhalation worker exposure	35ppm	0,69
PROC11	---	All routes	---	0,97
PROC13	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC13	---	Inhalation worker exposure	30ppm	0,59
PROC13	---	All routes	---	0,63
PROC8a	---	Dermal worker exposure	13,71mg/kg bw/day	0,04
PROC8a	---	Inhalation worker exposure	30ppm	0,59
PROC8a	---	All routes	---	0,63
PROC10	---	Dermal worker exposure	27,43mg/kg bw/day	0,07

PROC10	---	Inhalation worker exposure	7ppm	0,14
PROC10	---	All routes	---	0,21

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

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

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values